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OBSTETRICS AND GYNAECOLOGY

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Illustrations are included by arrangement with the Editor. Drawings should be done on white paper in black ink.

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In Memoriam

DONALD T. FRASER, M.C., B.A., M.B., D.P.H., F.R.S.C., Professor and Head of the Department of Hygiene and Preventive Medicine.

Dr. Fraser died suddenly in Santiago, Chile, on July 19, 1954 while serving the World Health Organization. He was born in Toronto in 1888 and graduated in Arts and in Medicine in the University of Toronto. Long associated with the Department of Hygiene and Preventive Medicine, he made many contributions in the fields of Bacteriology and Immunology, for which he received international acclaim. His students remember him as a kind instructor and a true friend.

WILLIAM L. ROBINSON, B.A., M.B., F.R.C.P.(C.), Professor of Pathology, Lecturer in Medical Jurisprudence.

Dr. Robinson, whose death occurred on March 26, 1954 was born at Portage-la-Prairie. He graduated in Medicine in this University in 1913, and was associated for many years with the Department of Pathology. He was well-known for his ability in medico-legal problems and in the investigation of cancer. In addition to his professional abilities, he displayed a keen interest in undergraduate affairs.

VALENTINE F. STOCK, M.C., V.D., C.D., B.A., M.D.(TOR.), F.R.C.P.(C), F.A.C.P., Special Lecturer in Medical Ethics and Economics.

Dr. Stock passed away on May 28, 1954, at the age of 65. Born in Tavistock, Ontario, he returned from distinguished service in World War I to set up practice and ultimately he became active on the teaching staff in clinical medicine. The respect he earned over the years was reflected in part in his appointment in 1951 as Fellow of the Royal College of Physicians.

It is impossible to convey fully an appreciation of how much these three members of the teaching staff have contributed to us, to their University and to the world, both academically and in a human way.

EDITORIALS

"T.L.C. & K."

Within the environs of a teaching hospital, we sometimes hear a general practitioner criticized, however mildly, for an instance of deficient care. As most of us will spend our lives in this branch of the profession, our immediate desire is to be assured of future success in the light of this apparent failure. Indeed, we begin to question even the possible advantages of a life in general practice. What, in the face of seemingly average skill and knowledge, can the family doctor hope to attain in a lifetime? He makes few, if any, purely technical contributions. Nevertheless, he *does* leave his mark. Recently, a group of us drove out to a small Western Ontario town to attend the funeral of one of the community's family physicians, a man who had practised there for more than thirty years. The church was filled to overflowing with grateful patients. These people were deeply sincere in their sadness; they had lost their doctor. And how had this man succeeded in his life's work? Why had he achieved satisfaction in his career? It was because he had always been kind and considerate to the people in his care. Now this sounds ridiculously simple: just be kind to your patients and you will be a success. Simple perhaps, and yet there are those who are oblivious to the real need for such understanding.

Illogical as it may seem to us now, Patients really *do* care as much for thoughtfulness as they do for technical skill. These observations are equally applicable to the future specialists. Indeed, they are more so, for it is obvious that one could submerge this essential understanding under an appalling weight of academic knowledge. In no other field of medicine is the need for a sensitive appreciation of this approach more acute than in the practice of obstetrics. A doctor whom I respected immensely as a man once wrote: "Kindness and thoughtfulness—this is my definition of charity". In the end, the application of these qualities has been the first requisite for many a satisfying professional life. Is it so considered by the average undergraduate or merely as an expedient adjunct to modern-day therapy?

About the Change

Herewith we introduce Volume XXXII and the results of a change in Journal policy. It has been decided that each issue this year be devoted to a major clinical subject. Obstetrics is the first of these and we have attempted to present an adequate cross-section of this field in the articles which follow. The remainder of the volume will tentatively consist of issues on Neurology and Psychiatry, Paediatrics, Orthopaedic Surgery, Endocrinology and Cardiovascular Disease. Every effort will be made to limit the topics discussed to those of current importance. The format of the Journal has been rejuvenated as well. We earnestly

solicit any constructive criticism you may have about these changes, either verbally or in a letter. It is obvious that the success of this venture depends on your opinion.

The Webster Scholarship

It is the desire of the Academy of Medicine of Toronto to endow an annual prize of fifty dollars for the best undergraduate paper published in the Journal. The prize is to be known as "The Webster Scholarship" and the first award will be made for an article in this volume. We are very grateful to the Academy for this generous gift which should do much to stimulate renewed interest in medical writing by students. The editors of the Journal are always willing to aid in the organization of an article, particularly with regard to sources of material and assistance from members of the teaching staff.

To Our Contributors

Much time and effort can be saved if the contributors to the Journal will heed the requests made on the masthead of this issue.

First Medical Year

A system of class advisers is to be established in the first medical year. Two students will be assigned to each of seventy-five advisers and so far as possible the students should continue with the same adviser throughout their course. The intention is that the adviser should see the student twice during the academic session and oftener if necessary.

The William Osler Medal

In order to stimulate interest and research in medical history among students of the Medical Schools of the United States and Canada, the American Association of the History of Medicine has established a Medal that will be granted annually to the author of the best student essay submitted to the Association.

The Medal has been named in honor of William Osler, who more than any other academic teacher succeeded in creating among students enthusiasm for the history of medicine.

The Association will consider unpublished essays by men or women who were students in Schools of Medicine and had not yet obtained their doctor's degree at the time the essay was written.

Essays that are the result of original research will be given preference but the Association will also consider essays which, without being the result of original research, show an unusual appreciation and understanding of historical problems.

Essays should not exceed 10,000 words in length.

Essays must be sent before March 1st, 1955, to

Lloyd G. Stevenson, M.D., *Chairman*
Faculty of Medicine,
McGill University,
3640 University Street,
Montreal, Canada.

THE PRACTICE OF OBSTETRICS AND GYNAECOLOGY

H. B. VAN WYCK, B.A., M.B., F.R.C.S.(C.), F.R.C.O.G., (Obit.)

Foreword

The late Dr. Van Wyck was Professor and Head of the Department of Obstetrics and Gynaecology from 1946 to 1950 and a member of the teaching staff for many years. He was a man of many and varied interests. This article is reprinted from the Journal for January 1948.

THIS dual specialty would be better described by the shorter name Gynaecology, if that term could be used to include the function and pathology of the reproductive organs in both the pregnant and the non-pregnant state. Such a limitation in nomenclature would help to settle the controversy that has disputed the necessity of the union between Gynaecology and Obstetrics. In most Universities, these two are regarded as closely knit divisions of one subject; and the union in our teaching departments is the result of this viewpoint; that neither the Obstetrician nor the Gynaecologist is properly trained without the mastery of both fields. The practitioner of this specialty has a field of no mean dimensions. He begins with human life before its genesis; follows it through its prenatal development to its birth; then centres his studies on the female during puberty and the reproductive period to begin again with birth and end with the menopause. He must master a limited field of anatomy, larger fields of special physiology, biochemistry, and pathology; learn the technique of obstetrical procedures and gynaecological surgery. After graduation and the final year of rotating interneship, the young graduate, if he chooses to become a gynaecologist, must secure three or four years post-graduate training—preferably one of these years being spent in one of the basic sciences.

Upon what grounds should the choice of such a specialty be made? Not certainly as would appear on superficial consideration, because of a predeliction for surgery as opposed to medicine, because the specialty overlaps both domains. The first can claim as large an interest in endocrinology as general medicine itself; the disorders of the female reproductive system are both medical and surgical. Nor can the choice be founded upon a desire for a life of pleasant medical dilettantism, nor any love of seeing the sun rise. One is, with any luck, usually in bed at least by that time. On second thoughts, I can find no adequate reason for the choice unless it be that one loves to travel by moonlight, when there is no traffic; the thoroughfares are free of dust, no disturbing temptations come from open pubs, and it may be some satisfaction to realize that by getting some major jobs done at night, these do not interfere with one's chores and routines in the hospital next morning. These delights are of course compensated for by the unpleasant though flattering tendency of humanity to plan to reproduce itself under your supervision—no one else will do—during week-ends desirable for a trip to the "cottage" or by the utterly puzzling facility with which nature can put full term to one of its anticipated fledglings after the first act of a delectable musical comedy. Nor do I know of any other medical problem about which so much unsolicited and irresponsible advice can be given than a tedious labour. But in

spite of all this and haemorrhage too, I know of no gynaecologist or obstetrician worthy of the name who would trade his profession for any other, and what seems curious they all seem to have tremendous practices. They enjoy their work so much that they seem to live for ever which is something to make pause to think anyone who hopes to succeed them. So that all in all, if a young medico makes such a choice, is willing to spend enough time in training, is willing and able to work irregularly and for long days and nights together, will forego many an enticing plan, will be willing to miss many church sermons because of the difficulty of Sunday morning attendance—in a word will cheerfully put the capricious and often precipitate whims of his patients before the domestic delights of cleaning the snow and tending to the furnace etc. etc., such a choice will never be regretted.

On the whole, no work is happier than obstetrics, and the comparatively low mortality of gynaecology (malignancy excepted) means that the gynaecologist works in a cheerful environment. Of the gynaecologist's wife in all this turmoil and absence, all that need be said is that I know of no domestic alienations—and why should there be—the husband has specialized in women and knows how to placate the sex.

After completing training, the young gynaecologist will proceed to a fellowship degree or certification. Granting of certificates of qualification to specialists in Canada is carried out by the Royal College of Physicians and Surgeons of Canada. The Council of the College appoints a Committee to carry out the function of certification. The members of this Committee are nominated by the functioning organization of the specialty.

The examination for certification in Obstetrics and Gynaecology at present is partly written and partly clinical and oral. Two papers are set, one covering the principles and practice of Obstetrics and Gynaecology and one on the application of the basic sciences necessary to the proper understanding of the specialty. The examination is conducted jointly by two gynaecologists. The qualifications for admission to the examination are satisfactory moral and ethical standing; graduation from a medical school approved by the Council; the production of documentary evidence of supervised study or practice during an aggregate period of least five years after graduation. One year must be spent in a general interneship approved by the Council, and two years must be spent in study and training in Obstetrics and Gynaecology in hospitals organized for that training. A period of the training is to be spent in the study of internal medicine or general surgery and the basic medical sciences. The candidate shall have spent the remaining portion of the 5-year period in the study or practice of the specialty. At least four months prior to the date of the examination, the candidate must forward to the Honorary Secretary of the College a completed application form together with the required documentary evidence, and the candidate will be admitted to examination only if the course of study and training is satisfactory to the Credentials Committee of the College. The examinations are held from time to time as determined by the Council of the College.

To the gynaecologist endowed with the instinct and will to enquire into and explore the unknown—the urge for research—his field opens up ever receding horizons which lure him forward. The mystery of life itself as exemplified in the limited and biologically ordered symbiosis of pregnancy, or in the strangely related disordered and parasitic phenomena of malignancy, is in the very focus of his vision; and perhaps in the

organie co-ordination between the invasive chorionic villus and the deeidual host lies ready for diseovery the seeret of eaneer. The curious investigator may ponder the relation between ontogeny and phylogeny in the growing ovum and attempt to unlock the teleology of evolution and its relation to dcterminism. With the development of the ovum, the metabolie dualism whieh in harmony is ealled normal reproduction and in dysharmony the toxaemias of pregnaney, has prodded the seientifie imagination to attempt the answcr. To bring further safeguards to the funetion of reproduction, the gynaecologist may find himself over the boundary of physiology and biochemistry invading the fields of physies, radiology, serology, and genetics; and, in the relation of reproduetion to the passage from youth to old age find the answer to many a riddle. To advance knowledge in a realm thus rieh in tantalizing potentialities may wcll attract the keenest minds.

In the history of gynaeeology and obstetries, the sueeesses of thc prescnt and the hopes of the future must not be allowed to obliterate the memory of the strivings and vietories of the past. The aspirant to a eareer in this speeialty may well acquaint himsclf of the long, slow history of absence to the present standards. Here lies buried a rich lore of wisdom and folly, brilliant and daring intuitions, and toil, always laborious, often of pedestrian monotony and, as its great moments, heroie. Regard for thc past is a preeious faeulty of eivilized man. If the past be nothing but a dead hand, if it be not regarded as the matrix of the present and the future, he will fail to read its lessons or to shun the elosed paths chosen only by the blind.

In the cycle to which we belong, we ean see only a segment; to look ahead we must often look baek many a eentury.

The compass guiding the advance in gynaeeology has pointed in every direction. The priests of ancient peoples aseribed the diseases afflieting women to the malign influences of unpredictable and supernatural forces of the moon, the planets, and the gods themselves; and primitive gynaecologists treated their patients with prayers and amulets to propitiate their hostile deities. Today, after eenturies of vacillating progress, the mysteries of hormones and vitamins oeeupy the stage, and the eynic may find somc amusement in pointing out that the whcel has gone full circle from libations in the Tcmple of Appollo to psyeho-analysis. To silence the seoffer, one needs only to point to the reeord of achievement in seientifie development during the past hundred years. The upward trail as it may bc surveyed in retrospect has been hallowed by such pioneers as Semmelweiss, Holmes, Simpson, MacDowell, Pasteur, Virchow, Lister, Bernard, Zondek and a host of others. Technical processes havc been pcrfeeted and surgieal proecdures restricted to their propcr ficld, while in thc laboratory new eonecpts in great profusion are bursting into view. Gynaccology and Obstetries share a rieh heritage. Whether the present period of aetive advanee wil bc followed by the periods of stagnation whieh the eenturies havc often recorded is a query that the present state of our world presents. Scienee has always advanced wherever men are free and religions are tolerant. To-day freedom must be prized and defended as never before, and the most strategie of its bastions to fall would be seientific freedom, whether the foe be within or without the State. Without a diseiplined freedom the praetice of medicine in any of its fields becomes degraded and menial.

The standard of effieiency of the speeialty of Obstetrics and Gynaecology in

Canada must and will be maintained on an ever higher level. Undergraduate medical education today equips the practitioner with a grade of training undreamed of by past generations; and general practitioners who have taken adequate post-graduate training, will continue to attend perhaps the majority of the confinements in this country. Hence the specialist must by sound additional training be worthy and able to assist and advise his colleagues in the community in their more difficult problems. No mere self-acclaim will enable him to win their confidence and respect —the only road to this desirable and useful place in a community is thorough, long, and ardous training.

Of advice to the aspiring young gynaecologist, one would note that the sounder the knowledge of basic science and general medicine, the more efficient the gynaecologist becomes. A wide range of reading of the few classic and the many current contributions, discussions, travel to other centres, and intense application to the duties at hand, are means to success; but one's advice would not be complete if one did not also stress the development of the personality and character that makes a good gynaecologist a better one;—equanimity, courtesy, gentleness, and a sympathetic understanding. Roughness or crudeness in word or deed do not appear to advantage in an obstetrical environment.

To one who is fitted for this work by training and natural endowment, the specialty of Obstetrics and Gynaecology offers a career of useful service well worth the investment of all one's life and energy.

SYSTEMIC DRUG ANALGESIA IN CHILDBIRTH

P. L. HEYLAND, 5T5

THE relief of pain in childbirth may be accomplished by one or more of:

1. systemic drug analgesia
2. inhalation anaesthesia
3. spinal anaesthesia (continuous caudal or spinal block)
4. local infiltration of the perineum and pudendal block
5. psycho-analgesia

This article will be limited to a discussion of some of the common methods used in systemic drug analgesia.

Ransom, in her excellent book, gives the following criteria for drugs employed in obstetrical analgesia:

(a) the final effect must be satisfactory to the mother, with loss of pain and retention of memory,

(b) they must be harmless to both mother and child, and must not interfere with the progress of labour, and

(c) they must be practical.

The Drugs

HYOSCINE This drug is a mild depressant of the central nervous system; in the presence of pain, it can cause restlessness and excitement, hallucinations and delirium. Hyoscine also depresses the parasympathetic nervous system. It is used in obstetrics because of its amnesic effect, which is more pronounced when it is combined with other drugs.

MORPHINE This is the most potent analgesic; however, it acts as a respira-

tory depressant, and may produce excitement, nausea, and vomiting. It passes through the placenta readily and depresses the respiration of the newborn infant. Morphine decreases uterine tone slightly, and increases the interval between contractions, thereby rendering them more effective. It is particularly useful in providing a good rest during prolonged labour.

BARBITURATES These drugs are hypnotics rather than analgesics; they may raise the pain threshold slightly, but this is doubtful. In combination with hyoscine, they produce a deep amnesia, and are used for this purpose in some American centres. These drugs are used a great deal today for pre-analgesic sedation and relaxation, and are very valuable in the early stages of labour. The barbiturates are, however, respiratory depressants and, since they cross the placental barrier easily, they will affect the respirations of the newborn as well as those of the mother.

DEMEROL This is an excellent analgesic, changing the attitude to pain and allowing the patient to relax between contractions. The patient remains cooperative throughout the second stage and may become slightly euphoric. On the other hand, Demerol can cause a slight degree of maternal respiratory depression.

The Combinations

MORPHINE AND HYOSCINE This is the original combination of analgesic drugs; it has been supplanted in recent years by others. It produces a state of amnesia called (by Gauss in 1907) Twilight Sleep or Dammerschlaff. This is a semiconscious state in which the patient appears to feel the pains but sleeps between them, and does not remember them after delivery.

Administration When labour has started, 100 mg. of Seconal can be given to relax the patient. With progress, when the cervix is dilated to about 3 cm., 0.3 mg. hyoscine and 10 mg. morphine are given hypodermically. The hyoscine is repeated later in order to keep the patient's mental condition in such a state that her speech is slurring and incoherent. The room should be darkened and quiet.

Actions

1. *effect on the mother*
   (a) analgesia and amnesia
   (b) decreased co-ordination and mentation
   (c) no respiratory depression when dose of morphine is kept to 10 mg.
   (d) increased pulse rate but no change in blood pressure
   (e) thirst, dry mouth, visual and auditory hallucinations, delusions, restlessness, and euphoria
2. *effect on the uterus*
   no impairment of expulsive forces, nor lengthening of labour if proper dose is used
3. *effect on the infant*
   anoxia neonatorum occurs in 18%, with 6% requiring active resuscitation

See Fig. 1 for *Advantages, Indications, Disadvantages, Contraindications.*

BARBITURATES AND HYOSCINE The next combination of importance was that of the various barbiturates with hyoscine. These were used a great deal at one time and are still popular in some centres. There is almost no analgesia; the main effect is of partial or complete amnesia.

Administration Before the pains become severe, 60-100 mg. of Seconal are given. When labour is well established, with the cervix 3-4 cm. dilated, 0.3 Gm. of Amytal, Seconal, or Nembutal are given orally, followed in 20 minutes by 0.3-0.4 mg. of hyoscine hypodermically.

FIG. 1

	MORPHINE AND HYOSCINE	BARBITURATES AND HYOSCINE	DEMEROL AND HYOSCINE
ADVANTAGES	Good analgesia and moderate amnesia. Induction and maintenance of anaesthesia is easier.	Potentiate the amnesic effect of hyoscine. Psychic sedation. Augment analgesic effect. Low fetal and neonatal mortality. Induction and maintenance of anaesthesia is easier.	Good analgesia with least amnesia. Minimal neonatal apnoea. Mother rational, co-operation is maintained throughout second stage. Fewer side effects. Less anaesthetic is required. Relaxes cervix.
INDICATIONS	Normal labour. Prolonged labour. Maternal heart disease. Toxaemias of pregnancy.	Where complete amnesia is desired, it is attainable with less neonatal respiratory depression.	Normal labour. Prematurity.
DISADVANTAGES	Neonatal respiratory depression (not severe if infant full term). Excitement and restlessness. Less co-operation in second stage, with more operative deliveries.	Action of barbiturates uncertain in some mothers. Excitement and over-activity make constant care essential. Transitory neonatal apnoea in 20%.	Risk of restlessness and excitement.
CONTRA-INDICATIONS	Prematurity. Primary uterine inertia. Maternal diabetes. Suspected erythroblastosis.	Heart disease. Prematurity. Primary uterine inertia. Maternal diabetes. Suspected erythroblastosis.	Primary uterine inertia. Maternal diabetes. Suspected erythroblastosis.

The patient is placed in a quiet, dark room, and the hyoscine is repeated at hourly intervals, depending on the state of the patient, in doses of 0.1-0.2 mg. The total dose of hyoscine is not to exceed 2 mg. At the Boston Lying-In Hospital, apomorphine has been added to reduce the tendency towards restlessness, but it must be remembered that it also is a respiratory depressant.

Actions

1. *effect on the mother*
   (a) amnesia
   (b) respiratory depression
   (c) diminishing smooth muscle tone
   (d) decreased B.M.R.
   (e) restlessness and excitement
   (f) possible pulmonary oedema
2. *effect on the uterus*
   there is little effect on the actual forces of labour
3. *effect on the infant*
   (a) respiratory depression
   (b) sluggish reflexes, flaccidity, and somnolence
   (c) bradycardia
   (d) decreased body temperature
   (e) indifference to nursing

See Fig. 1 for *Advantages, Indications, Disadvantages, Contraindications.*

DEMEROL AND HYOSCINE This is one of the more recent combinations, and is in wide use today. Hyoscine is used here to augment the Demerol rather than to produce amnesia.

Administration After labour pains have begun, but before there is severe discomfort, 100 mg. of Seconal are given orally to produce relaxation. With more severe pains, when the cervix is dilated 5 cm. in a primipara or 3 cm. in a multipara, 100-150 mg. Demerol and 0.4 mg. hyoscine are given. The dose of hyoscine can be repeated in one hour's time if necessary, and the complete combination every 4-6 hours thereafter. No hyoscine is given after the cervix has reached 7 cm. dilatation.

Actions

1. *effect on the mother*
   (a) analgesia and amnesia
   (b) altered attitude to pain
   (c) no respiratory depression
   (d) transitory rise in blood pressure
   (e) minimal restlessness and excitement; a mild state of euphoria may result
   (f) may have nausea and vomiting
2. *effect on the uterus*
   (a) cervix dilates more readily
   (b) transitory lengthening of intervals between contractions
   (c) no increase in incidence of forceps delivery
3. *effect on the infant*
   (a) no increase in neonatal apnoea: A report by the late Dr. Goodwin and Dr. Tait of the Toronto General Hospital, on 1200 deliveries in which this combination was employed, stated that spontaneous respiration occurred in 96%, delayed respiration in 2%, and 0.6% were stillborn
   (b) no increase in stillbirths or neonatal mortality

See Fig. 1 for *Advantages, Indications, Disadvantages, Contraindications.*

Summary and Conclusion

Three combinations of drugs used in obstetrics to produce systemic analgesia are discussed: morphine and hyoscine, barbiturates and hyoscine, and Demerol and hyoscine. Of these, the combination of Demerol and hyoscine, together with pre-analgesic Seconal, is most widely accepted. This method has the advantage of promoting excellent maternal analgesia and co-operation in the relative absence of neonatal respiratory depression or marked amnesia.

From a psychological standpoint, the ideal birth would be one in which the patient is fully conscious, feels minimal pain, and can remember the thrill of giving birth to her child. At present no analgesic agent or combination of agents fulfils this ideal. Any plan which is to approach this goal must include not only the most efficient pharmacological agent but also the sensitive combination of adequate psychological preparation with consistent kindness, understanding and tact.

Acknowledgement

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THE Rh FACTOR IN OBSTETRICS

D. M. LOW, M.B., F.R.C.S.(C.), F.R.C.O.G.*

THE Rh factor is of importance to obstetricians for two reasons:

(1) as the cause of Haemolytic Disease of the Newborn.

(2) all transfusion reactions which cannot be explained on a basis of A or B incompatibility have occurred in men or women who had been previously transfused, or in women who had been recently pregnant, the pregnancy usually having terminated in the delivery of a stillborn foetus or in an abortion. Nearly all such reactions are due to Rh incompatibility.

The recognition of Rh factor came about as a result of investigations into the reason for some inexplicable transfusion reactions where the ABO matching was correct. In 1940 Landsteiner and Weiner found that by injecting the red blood cells of the Rhesus monkey into rabbits there was produced an immune or "sensitized" serum which was found to agglutinate the red blood cells of 85% of the white population, and which failed to do so in 15% of the population. Thus the 85% of whites are called Rhesus or Rh positive, and the 15% are Rhesus or Rh negative. Following discovery of the Rh factor it was noted that in cases of Hemolytic Disease of the Newborn, over 93% of such mothers were Rh negative, and 100% of the fathers and infants Rh positive. Thus was proven the role of the Rh factor in Haemolytic Disease of the Newborn, and this has since been amply confirmed. It is also now accepted that many of the transfusion reactions occurring in pregnancy and post-partum periods are due to the development of Rh antibodies in Rh negative women who are carrying or have recently carried Rh positive children. Such Rh negative women may also have developed Rh antibodies from previous transfusions of Rh positive blood.

To illustrate the increasing complexity of typing for transfusion purposes, it is now possible in any moderately well equipped serological laboratory to differentiate nearly 1,200 different types of blood. In fact it is possible that blood types may become so finely differentiated that they may be as specific as fingerprints.

Blood Groups and Types

(1) Groups
O, A_1, A_2, B, A_1B, A_2B = 6

(2) Types
Secretors (85%) ×2 = 12
No " (15%)

(3) Types
M, N, MN ×3 = 36
(very little antibody production)

(4) Types
P+ (75%) P– (25%) ×2 = 72

(5) Types
Rh: 16 types and subtypes ×16 = 1152

The importance of Rh factor typing in blood transfusions is that the Rh factor produces anti-Rh agglutinins, whereas M, N and P factors do not as a rule. For the most part we have our patients typed as one of the 4 primary blood groups, and as merely Rh positive or Rh negative.

Although it is found that in Rh negative people there are no natural antibodies to the Rh factor, they can be produced as a result of carrying a Rh positive child, or by injection or trans-

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fusion with Rh positive blood. Sueh patients ean be thus isoimmunized or sensitized to Rh faetor either by transfusion or pregnaney.

Historical Data

1901—Landsteiner designated 4 blood groups—O, A, B, AB—6 later—O, A_1, A_2, A_1B, A_2B.

1927—Landsteiner and Levine diseovered M N faetors and in 1928 P faetor.

1932—Diamond, Blaekfann, and Baty were the first to group the syndromes of anemia of the newborn: ieterus gravis, and hydrops fetalis as different degrees of severity of the eondition we now describe as hemolytie disease of the newborn.

1938—Darrow was first to suggest that the logieal explanation for Hemolytie Disease of the Newborn might be in an antigen-antibody reaetion other than A or B.

1940—Beginning about 1937 Landsteiner and Weiner reported the new antigen they ealled Rh factor. 85% of white people had this antigen, being Rh positive, and 15% laeked it, being Rh negative.

There have been many different subtypes diseovered sinee the original identifieation of Rh factor, but for routine elinieal purposes only the factors D and d are important.

The Rh faetor is also inherited as a simple Mendelian dominant, the Rh negative gene (rh) being recessive. Everyone has reeeived a double dose of the Rh faetor, one from his father and one from his mother. Either one may be positive or negative. Thus all Rh positive people are either DD homozygous or Dd heterozygous. All Rh negative people are dd homozygous and ean only pass on the negative gene. Clinically the most important type of isoimmunization is for an Rh negative (dd) person to be sensitized against the D faetor.

Laboratory Tests

(a) A heavy suspension of known Rh positive cells is mixed with the woman's serum by tilting baek and forth on a slide, and observed for agglutination. Known different groups of Rh cells must be used to rule out all types, but as a general rule using CDE will take eare of 95% of the tests.

(b) To get the aetual titre of the immunization, a 2% suspension of the cells is ineubated at 37 degrees in a water bath with dilution of the serum. It has been found that when the serum is diluted with normal saline the antibodies are shown in about 25%, and in others it is necessary to dilute the serum with albumin, and to do this a 20% solution of bovine albumin is used. This is the origin of the term "blocking antibody", and a laboratory reporting of 1:8 blocking antibodies means that the serum has been diluted with albumin.

Hemolytic Disease of the Newborn

Hemolytie Disease of the Newborn is the greatest cause of inherited disease mortality in infants. In 95% of cases the Rh negative mother is auto-immunized to the Rh positive foetus. Immunization to Rh is rare in pure coloured raees and almost non-existent in oriental people. Hemolytie disease of the newborn oeeurs about once in 400 obstetrical patients, and only about 5% of pregnant Rh negative women with Rh positive husbands develop antibodies. It is not uncommon to have 1-4 normal ehildren in sueh matings. There are apparently marked individual differenees in sensitivity to isoimmunization by the Rh faetor. Foetal red eell antigen gains aecess to the maternal cireulation by plaeental diffusion, placental break or from previous transfusion of the Rh positive blood. Approximately 50% of Rh negative individuals transfused with Rh positive blood will within a period of three months develop antibodies against Rh.

CLINICAL TYPES

In order of severity of the disease we speak of four clinical types of Hemolytic Disease of the Newborn.

1. *Simple Anemia* – relatively mild form–cord hemoglobin level of 11 Gms % or higher–may require no treatment other than continual observation–simple transfusion usually all that is necessary.

2. *Icterus Gravis*–the severe form and the largest group–increased erythroblasts–develop severe jaundice within 24 hours of age–a rapid all in the Hg.–liver and spleen enlarged; those that die become severely jaundiced and succumb to convulsions or cyanotic attacks–in some who survive there may be evidence of "kernicterus" because of damage to the basal nuclei of the brain causing severe neurological changes and mental retardation.

3. *Congenital Hydrops* – generalized oedema and ascites–skin pale–easily macerated–liver and spleen enlarged–pigment deposits in kidneys, and suprarenal as well–placenta oedomatous and pale pink–ratio in weight to foetus 1:3 instead of usual 1:6.

4. *Macerated Foetus* – intra-uterine death – Rh factor immunization often present in the mother. Same pathological changes seen in foetus.

OBSTETRICAL MANAGEMENT OF THE RH NEGATIVE PATIENT

1. At the present time there is no known method whereby the formation of antibodies can be either prevented or ameliorated.

2. All obstetrical patients at or about 16 to 20 weeks should have Rh factor determinations made, and if they are found to be Rh negative should be tested for antibodies.

3. If antibodies are present a recheck as to titre should be made at about 30 to 34 weeks.

4. In all cases of isoimmunization, and especially where one or more infants have been born suffering with or have died of congenital hemolytic disease, an attempt should be made to determine the Rh subtype of the father to aid in giving prognosis in the event of future pregnancy. If any living children of this mating should be proved Rh negative, it may be assumed that the husband is heterozygous.

5. Even if the father is homozygous and the mother Rh negative isoimmunized with a previous history of one or more stillbirths or neonatal deaths because of hemolytic disease, therapeutic abortion is not advised since live births or survival following treatment during the neonatal period may still occur. However, if in such cases contraceptive measures are not possible or accepted, tubal sterilization might be considered.

6. All Rh negative patients are allowed to go into spontaneous labour at term if possible, unless artificial rupture of the membranes or cesarean section at or prior to term is indicated for other obstetrical reasons.

7. A sample of cord blood for the Coombs test is taken at birth of all infants born of Rh-negative mothers who show antibodies. Care is taken in such cases to clamp the cord about three inches from the navel to facilitate transfusion if this is found necessary and to obtain blood.

8. Replacement transfusion is carried out as soon as possible after birth, preferably within 12 hours for those infants showing positive Coombs test.

SUMMARY OF THE OBSTETRICAL PROGNOSIS FOR THE RH-NEGATIVE MOTHER

1. The group of Rh-negative mothers who do not show antibodies present no problem.

2. The group of Rh-negative mothers who do show antibodies but have infants

born with negative Coombs test have excellent prognosis as to survival of the infant.

3. The group of Rh-negative mothers who show antibodies, and who have had an infant surviving treatment for hemolytic disease have no better than an even chance that the succeeding infant will likewise survive treatment.

4. The group of Rh-negative mothers who show antibodies and who have had previous stillbirth or neonatal death following failure of treatment for hemolytic disease will have only very slight chance of bearing any succeeding infant even with similar treatment.

CONCLUSIONS

Until some proved method is found of preventing the development of congenital hemolytic disease during the prenatal period, it is evident that during this period Rh-negative mothers should have continuous observation and repeated reassurance. As a rule, they can be allowed to go into spontaneous labour at term. A Coombs Test should be taken from the blood of all infants born of Rh-negative mothers who show isoimmunization. Immediate replacement transfusion offers a high salvage rate for those infants who show a positive Coombs test except in cases of hydrops. In order that this replacement transfusion be done immediately it must be considered an emergency procedure, and suitable personnel and equipment should be available at any moment. The initial hysteria and fear aroused in the minds of obstetricians and Rh-negative obstetrical patients during the past decade should be allayed.

UTERINE CARCINOMA

J. W. GOODWIN, 5T5

J. W. ROGERS, M.D., F.R.C.S.(C.)*

IN the following discussion, some of the more salient facts concerning the aetiology, pathology, and diagnosis of the uterine carcinomata will be reviewed, together with an outline of their treatment.

Statistical studies by the various government public health services have established the uterus as the second most frequent site of malignancy in the female. The Department of Vital Statistics of the Province of Ontario has recently reported that about 20% of female cancer deaths in the Province are due to uterine tumours.

Carcinoma accounts for approximately 93% of uterine malignancies. It is definite that carcinoma of the cervix is seen more frequently than that of the endometrium, but the ratio of one to the other varies widely in the literature. Complicating this is the fact that endometrial malignancy has apparently become more common in the last two or three decades. Curtis[1] states that up to 20 cervical carcinomata were diagnosed for every endometrial type 20 years ago, but in most authors' series today the ratio has declined at least to 5:1[2,3,4] and recently it has been reported as low as 1.08:1.[5] Such an increase may be more relative than absolute. It is true that more women today are reaching the cancer age group, but efficient diagnostic methods and

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changing concepts of what constitutes malignancy account for a greater part of the increase.

Aetiological Factors

Most of the factors will be discussed in the light of their association with one o the carcinomata. This does not necessarily preclude their possible realitonship to the other.

AGE Women developing invasive carcinoma of the cervix are diagnosed at 48-51 years of age in most series.[2,3,4] It is relatively rare before 30. It is of interest to note that cervical carcinoma-in-situ (pre-invasive or intra-epithelial carcinoma) is demonstrated roughly ten years *earlier* than the invasive type.[6] Endometrial malignancies, on the other hand, are usually exposed ten years *later*, the peak age incidence being 56-59 years.[7,8,9]

RACE Rothman *et al.*[10] have recently reported that cervical carcinoma is one-ninth as common in Jewish women as in the non-Jewish. This seems to be the only significant racial difference.

PARITY It is generally agreed that 80-90% of women who develop cervical cancer have borne children.[2,4,11] (The parity rate of the normal population is approximately 70%.) On the other hand, the rate for women with endometrial carcinoma is not as well defined, but is not infrequently reported as 55-65%.[8,12]

RELATION TO MENOPAUSE A large proportion of the women in whom endometrial malignancy later develops have experienced the menopause.[7,12]

HEREDITY Murphy[13] has recently completed a study of possible hereditary influence in women developing cervical cancer. He found that the cervix was a more common site of malignancy in the relatives of the afflicted women than in the control family groups. He also found that the mothers and aunts of cancer patients had a higher incidence of cervical malignancy than the patients' sisters. Many similar investigations have been carried out, but the results are frequently at variance.[14,15] Novak[16] is of the opinion that an hereditary tumour constitution may be so strongly developed in a woman that no exciting agent is necessary for the initiation of malignant change. If, however, any such play of genetic factors is to be considered in the aetiology, their effect would seem to be achieved by co-operation with some extrinsic factor or factors.

HYPEROESTROGENISM That oestrogens have a chemical structure similar to the more powerful carcinogenic agents, and have, in large amounts, produced cancer in laboratory animals, is well known. Of particular interest here is that excess oestrogen which is unopposed by progesterone. Obviously, conditions featuring endocrine imbalance of this kind will be seen more frequently during and after the menopause. Some of these have been seen associated with cancer often enough to warrant suggestion of a possible relationship.

Endometrial Hyperplasia Persistent stimulation by a surplus of oestrogen is known to cause hyperplasias of the endometrium. Those occurring before the menopause are rarely a pathological problem.[17,18] It is post-menopausal hyperplasia, particularly in its atypical forms, which has provoked the most interest. In 1936, Emil Novak and Yui[17] described a series of 104 cases of endometrial carcinoma, 25 of which were associated with marked adjacent hyperplasia in women well beyond the menopause. Since that time much has been writte non the possible interrelation of the two. Cases of endometrial carcinoma in which only hyperplasia was previously demonstrable have been reported. Novak and Rutledge[19] have analysed some of the difficulties of differentiating

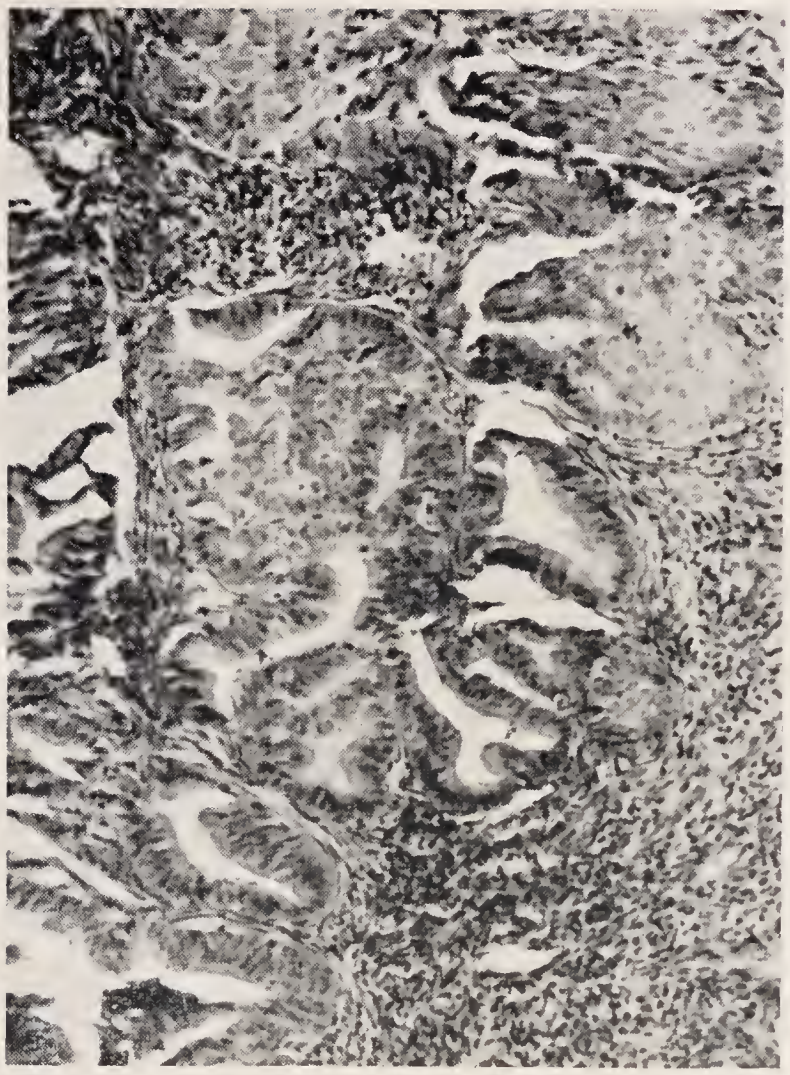

FIG. 1.—Atypical endometrial hyperplasia, which was mistaken for carcinoma. Note the metaplastic change of the endometrial epithelium in an area of adenomatous glandular proliferation.

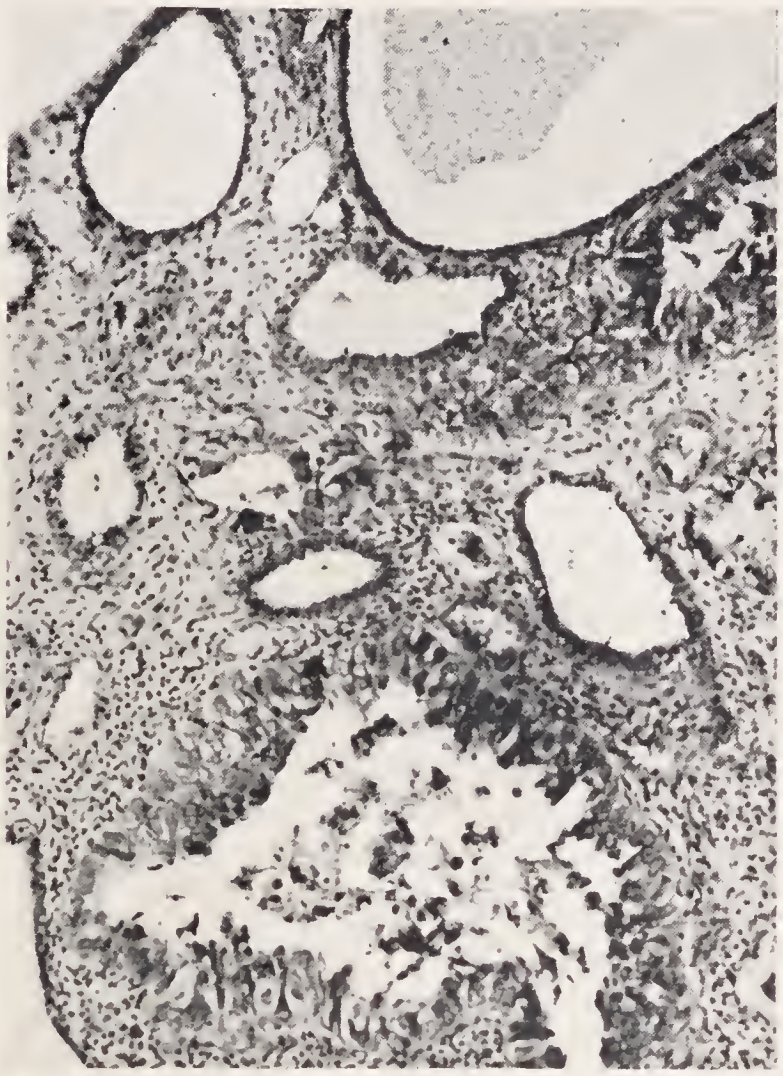

FIG. 2.—Glandular hyperplasia of the endometrium ("Swiss cheese" hyperplasia (top)) and early adenocarcinoma co-existing in the same field. It is unusual to see these conditions in such proximity.

between overgrowth and new growth (see Fig. 1). On the odd occasion, it is possible to see all gradations from the obviously benign "Swiss-cheese" hyperplasia through atypical proliferative patterns to frankly malignant tumour in one section (see Fig. 2).

Abnormal Sources of Oestrogen The remainder of the theories under consideration are concerned with possible sources of oestrogen producing the hyperplastic (and perhaps the neoplastic) changes.

1. late menopause (and thus perhaps more anovulatory cycles)[7,12]
2. prolonged oestrogen therapy[20,21]
3. ovarian stromal changes (stromal cell hyperplasia, thecoma, and "diffuse thecomatosis"—assuming that theca cells are oestrogenic in nature)[22,23,24]
4. feminizing tumours of the ovary (granulosa cell tumours)[25,26]
5. adrenal cortical oestrogens[3]

CONSTITUTIONAL DISORDERS Recently, interest has arisen in the observation of an apparent increase in the incidence of diabetes, obesity, and hypertension in patients with endometrial carcinoma. The reported incidence of diabetes, for instance, varies from 4%[9] to 18%.[23] The incidence in the normal female population over 35 years of age is 1.02%.[27] Obesity and hypertension are sufficiently common in this age group that any correlation could not be significant. Nevertheless, Novak and Mohler recently suggested that these disorders might be in league with the source of excess oestrogen in a sort of generalized hormonal imbalance, possibly under the

control of a disturbed pituitary gland.

CERVICAL LACERATIONS As was previously noted, 80-90% of women with cervical cancer are parous. Trauma to the cervix and the chronic inflammation with erosion frequently complicating these tears have, for many years, been considered important predisposing lesions. Boyd, however, states that in no other site is a laceration carcinogenic, even though infected. On numerous occasions, Novak has seen carcinoma occur in locations distant from an erosion and in completely healthy cervices. Gagnon[28] has used one of the more ingenious methods in the literature to defend the theory. He studied a group of 13,000 nuns over a period of twenty years. In this time, 14 cases of endometrial malignancy developed but *none* of the cervical variety. Since lacerations and cervicitis are, for obvious reasons, highly improbable in such a situation, Gagnon concluded that these lesions are extremely important aetiologically. The authors would hasten to point out, however, that not only were cervical lacerations absent from this group, but also other possible aetiological factors such as the hyperoestrogenism of normal pregnancy.

PREGNANCY The rapidity with which some cases of cervical carcinoma grow during a concurrent pregnancy has been ascribed to two factors:

1. the boggy, hyperaemic character of the cervical tissues due to increased vascularity
2. the saturation of the cervical mucosa with large amounts of oestrogens due to the high blood levels associated with pregnancy

However, in some recent series, this observation has not been confirmed.

OTHER SUGGESTED FACTORS

1. inadequate drainage of the uterine cavity
2. myomata
3. leukoplakia and other so-called "precancerous" lesions of the cervix
4. syphilis.

PATHOLOGY

CARCINOMA OF THE CERVIX

Squamous Cell Carcinoma This variety occurs 19 times as frequently as adenocarcinoma of the endocervix. In the *gross*, the site of origin is usually at the squamo-columnar junction or on the margin of an erosion or laceration. Eventually the tumour takes on one of two configurations:

1. It may grow outwards to form a fungating mass which may be extensive enough to fill most of the vagina.
2. It may grow inwards to infiltrate the whole structure of the cervix, replacing it with friable, greyish-white tumour tissue. This will chip away on slight trauma so that the advancing front of infiltration leaves behind a ragged, bleeding crater.

In time the surface in either case becomes necrotic, ulcerated, secondarily infected, and productive of a very foul-smelling bloody discharge.

On *microscopic* examination, approximately 75% of these tumours occupy an intermediate position, i.e. with moderately mature cells and architecture. The remainder are equally divided between the well-differentiated and the extremely immature picture. Martzloff has termed these the transitional, spinal, and spindle cell varieties respectively.[3]

Adenocarcinoma In the *gross*, the tumour usually takes the form of an endocervical crater which may not be evident per vaginum until it is far advanced. One author has escribed it as an analogous to a fire in an old frame building;

when it is noticed from outside, the damage within is already such that salvage is practically impossible.

On *microscopic* examination, any degree of differentiation may be seen. Pale staining cells characteristic of the endocervix are arranged in a pattern which resembles normal gland structure in the more mature forms.

Carcinoma-in-Situ On *gross* examination of the cervix, there is usually no lesion at all. Most diagnoses are made from biopsy specimens and vaginal cytologic examination.

The *microscopic* diagnosis of carcinoma-insitu is a task for the trained pathologist. To be accepted as a true pre-invasive lesion, *all* layers of the epithelium must be replaced by the cellular changes and the basement membrane must be intact.[6]

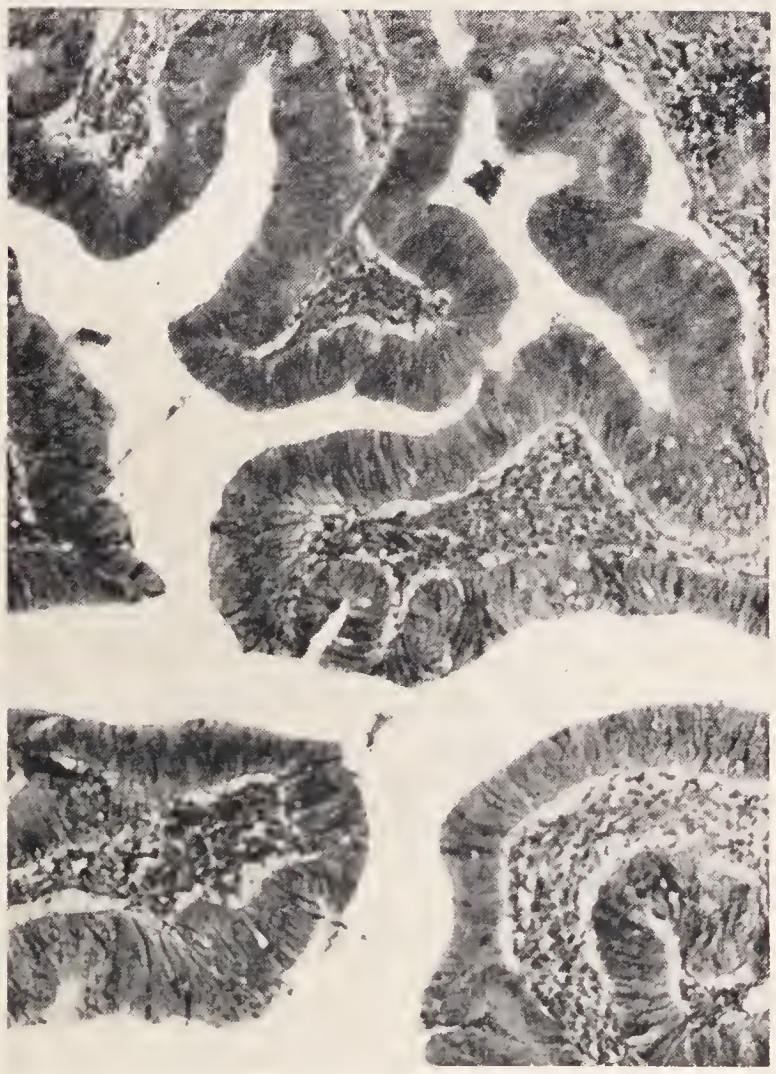

FIG. 3.—A moderately well differentiated endometrial carcinoma (adenoma malignum). The papillary projections are covered by tall, dark-staining columnar cells in which there are many mitotic figures.

CARCINOMA OF THE ENDOMETRIUM

Adenocarcinoma The typical *gross* appearance is that of a cauliflower-like mass which may involve any amount of endometrium: it may arise from almost the whole surface as a diffuse process, or from a very small portion of it as a discrete polyp. Infiltration deep into the uterine musculature is a relatively late event and the uterus may then be enlarged to twice its normal dimensions by the growth within. Diagnostic curettage produces chuncks of greyish-pink material which are easily scraped away by the instrument. (Healthy endometrium is removed as definite pink strips.)

As in cervical carcinoma, three *microscopic* pictures are recgnized, representing low, intermediate, and high grades of malignancy. These depend on the degree to which gland pattern is preserved, and the amount of cellular differentiation (see Fig. 3). Stroma is scanty in the less mature forms and patches of necrosis are very frequent.

Acantho-adenocarcinoma (so-called Adenoacanthoma) This is an infrequent variant of low-grade adenocarcinoma in which islands of malignant squamous metaplasia replace some of the gland-like epithelium of the tumour.

DIAGNOSIS

Although carcinoma of the uterus may occur at any age, the cervical variety, as we have seen, has a peak age incidence in the late 40's, while the endometrial or corporeal type is most common ten years later. Consequently, any unusual vaginal bleeding at or following the menopause should be regarded as malignant in origin until proven otherwise.

HISTORY Patients with either type of lesion may present with watery dis-

charge or bleeding varying in amount from slight spotting to massive haemorrhage in the late stages. Unfortunately for early diagnosis, pain, sensations of pressure, and other symptoms for which patients seek medical attention are all late manifastations of the disease: weight loss, malaise, and general constitutional symptoms do not make their appearance early. In carcinoma of the cervix, post-coital staining is not an unusual complaint; however, it is associated with many benign lesions as well. Although carcinoma of the endometrium must be considered to be the cause of post-menopausal bleeding until ruled out, it is by no means the most common cause. Where the menopause is not yet established, bleeding will take the form of meno-metrorrhagia.

It follows that the onset of symptoms is so insidious that they are frequently neglected by the patient and, indeed, too often by the physician himself.

PHYSICAL EXAMINATION

Apart from the very advanced cases of uterine malignancy, where extension is wide and the general effects marked, the physical findings will be confined to those encountered on rectal and pelvic examination.

Carcinoma of the Cervix Physical findings vary according to the extent of the lesion and the disease has been divided into five *clinical* stages accordingly (the League of Nations classification):

Stage 0 Carcinoma-in-situ (also known as pre-invasive or intra-epithelial carcinoma).

Stage 1 The carcinoma is strictly confined to the cervix.

Stage 2 The carcinoma extends beyond the cervix but has not reached the pelvix wall. The carcinoma involves the vagina but not the lower third.

Stage 3 The carcinoma has reached the pelvic wall (on rectal examination no space can be palpated between the pelvic wall and the tumour). The carcinoma involves the lower third of the vagina.

Stage 4 The carcinoma has extended further, or involves the bladder or rectum.

The appearance which may be presented by the cervical malignancies on speculum examination has been described elsewhere in this paper.

Carcinoma of the Endometrium

Routine pelvic examination is frequently of little aid in making this diagnosis when the disease is still confined to the endometrium. The uterus may be somewhat enlarged, blood may be seen coming from the cervical os, and the passage of a uterine sound may result in bleeding where none existed previously. In advanced cases, where invasion and spread have occurred, the cervix or vagina may show gross lesions, or the uterus may be fixed by extrauterine spread.

PATHOLOGICAL EXAMINATION

The diagnosis of advanced uterine malignancy should not be a problem even to the relatively inexperienced, but early lesions can only be diagnosed or ruled out with certainty by pathological examination.

Carcinoma of the Cervix Many special tests have been developed to aid in the diagnosis of early cervical malignancy; interesting among these are the Schiller Iodine test and the use of the self-immuninating colposcope. Chemical tests and special instruments, however, have proved to be of little value in the early discovery of this type of cancer, and it remains an axiom of diagnosis that microscopic study of material from the suspect area must be carried out.

Many methods are advocated for obtaining these cells and current investigations are evaluating their relative merits. Among those regularly employed are:

1. aspiration and staining of cervical secretions by the method of Papanicolaou and Traut
2. scrapings of the cervical muscosa with a spatula, with fixing and staining of the removed material by the method of Ayre
3. regular knife and punch biopsies.

The first two methods are valuable screening procedures for elimination of non-malignant cases, but for final diagnosis in doubtful cases and in every case before treatment is undertaken actual biopsies should be obtained and studied pathologically.

When biopsies are reported to show the presence of carcinoma-in-situ, great care should be taken to obtain further material for study. Conization of the cervix should be carried out by means of a knife rather than by cautery, as well as curettage of the cervical canal. These specimens should be subjected to multiple serial sectioning and microscopic scrutiny in order to rule out the possibility of a true invasive malignancy. When such an investigation has been completed without producing evidence of invasive characteristics the diagnosis of carcinoma-in-situ may be considered to be established.

Endometrial Carcinoma A 55 year old woman, 5 years post-menopause, reported with a 3-4 month history of minimal vaginal spotting. Pelvic examination revealed a marked degree of atrophic vaginitis with many petechial areas in the vagina. Nothing else of note was encountered. The temptation is very strong in such a case to attribute her difficulties to the benign condition encountered and to forego further investigation. But adhering to the precept that malignancy must be ruled out, curettage was performed and endometrial carcinoma discovered. This case, recently seen by the senior author, illustrates the dictum that diagnosis must be established by examination, both gross and microscopic, of material removed from the uterus by thorough curettage. During curettage it is often possible to make an accurate diagnosis on the basis of the gross specimen alone. Typical malignant curettings are chunky, greyish in colour, and roll out on the curette in a characteristic manner. The more atypical types will of necessity have to await the outcome of pathological study. Unfortunately for the clinician, apart from the most obvious cases, which are readily recognizable in the gross, frozen sections are of little value in making the diagnosis and in doubtful cases treatment must be held in abeyance until regular parafin sections are examined.

Treatment

It is not within the intended scope of this paper to deal in detail with problems of treatment or to discuss controversial issues in this field. It is felt, however, that a brief outline of treatment of these conditions as carried out in the Toronto General Hospital may be of value, particularly to undergraduates who are often confused by the mass of controversial statements made on the subject.

CARCINOMA OF THE CERVIX Treatment of invasive malignant disease of the cervix is primarily radiological in nature. It is a combination of radium and x-ray therapy. The patient is first subjected to a calculated dose of *high-voltage x-rays*, directed at the pelvic structures through areas known as pelvic *ports*, by fractional administration. These ports and the amount of radiation administered

through them are determined by the radiotherapist in order to give a *tumour-lethal* dose of x-rays through the tissues in which tumour may spread. This approach is made prior to any attack on the primary lesion itself in order to prevent, as soon as possible, any extension of the disease. This series of treatments extends over several weeks; the dosage will depend on the patient's tolerance of the therapy.

Approximately 4-6 weeks after completion of high-voltage x-ray therapy the patient is admitted to hospital and the direct assault is made on the primary lesion by means of *radium*. Here again, the dosage is fractionated, three applications usually being employed to attain a total dosage. The first of these insertions is intra-uterine if possible, the radium (contained in platinum capsules in a rubber sheath) being inserted into the cervical canal. Two or three days after removal of the initial insertion, the patient is taken again to the operating room and the first of two intra-vaginal applications is given. In this type of treatment the radium is applied directly against the cervical lesion in one or other of specially shaped holders designed for this purpose. This procedure is repeated once more approximately 48-72 hours after removal of the previous radium. The patient is then discharged and followed closely for many months to determine the efficacy of treatment.

CARCINOMA OF THE BODY In this clinic it is felt that the most satisfactory means of dealing with endometrial carcinoma is pre-operative radiation followed by surgery. Radiation therapy applied in these cases is of the radium emanation type, and is applied either through multiple applicators or (more commonly) by platinum-shielded pellets in the cavity of the uterus. We believe this destroys the surface tumour and limits spread. Approximately 4000 milligramme-hours of radiation are given and the patient is then discharged from hospital. She then returns, in 4-6 weeks, and a careful total hysterectomy and bilateral salpingo-oophorectomy is carried out. Post-operative high-voltage x-ray is not routinely employed, but is reserved for those cases in which spread of the tumour beyond the body of the uterus has been found at operation.

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CAESAREAN SECTION

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CAESAREAN Section is one of the commonest procedures carried out in obstetrics and it would not be necessary to have many obstetrical cases before becoming involved in some aspect of the subject. There are still many honest differences of opinion as regards its frequency, type of operation, anaesthesia, indications and so forth. For these reasons I hoped it might be of interest to comment on some of these opinions and at the same time, by presenting some figures from the Mount Hamilton Maternity Hospital, demonstrate the general trend that is followed at this institution with regard to some of these matters. This is an open hospital where somewhat over 200 physieians deliver their patients. This then is a true cross-section of obstetrics in the community with no selection being made as to patient or doctor.

Incidence

How often should this operation be carried out?

Here right at the start one comes across a very wide difference of opinion. We see figures which vary from less than 2% to over 10% of deliveries. Although all the different figures are vigorously and honestly defended by their various originators, and although it is difficult if not impossible to present documentary evidence to the contrary, one cannot help but have the feeling that one patient in ten or twelve delivered by Caesarean Section is too high. Surely many of those cases could and should have been delivered vaginally. Just what the proper incidence should be has not been determined satisfactorily. Our incidence of 2.7% may be a little too low but it is our belief that the incidence need not be too much above that figure.

Mortality

What is a satisfactory mortality rate from Caesarean Section?

Taking all the sections done throughout the country at large it is probably near 2%. However, with the present availability of blood, chemotherapy, modern anaesthetics and careful preparation of patients it should be well below 1%.

Our mortality rate was 1.17%. During the first 5-year period it was 1.5% as against .99% for the next 5-year period. However, at the present time there have been just a little over 500 consecutive sections without a death.

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Type of Anaesthetic

This is a highly controversial subject and I will only mention the fact that we are very partial to spinal anaesthesia for Caesarean Section, and believe it to be most satisfactory if given in the lower dosages.

Type of Section

It would appear that the Classical type of Caesarean Section is gradually disappearing. The evidence seems to be greatly in favour of the Low Transverse Cervical Section as a routine type of section. Although there are a fair number of Classical Sections appearing on our list over a 10-year period, it is most unusual at the present time to encounter one.

One should mention the Extra-peritoneal Caesarean Section. Although many centres are reporting good results from the use of chemotherapy and the Transperitoneal type of section, we feel much more comfortable in the use of the Extra-peritoneal type of section in frankly infected cases. The technique is not too difficult and periodically one encounters a patient on whom one would hesitate to do an ordinary Caesarean Section as well as a Hysterectomy.

Indications

Although there is a wide variety of indications for Caesarean Section, I only propose to mention the more numerous. One must also keep in mind the fact that not infrequently several factors may arise which, occuring together, necessitate doing a section but when taken separately would not be sufficient. For instance an elderly primigravida with a borderline pelvis and a mild toxemia might require section, but either condition separately would not necessarily be sufficient.

disproportion As is usual in most series, disproportion is the commonest indication for Caesarean Section.

I think one is safe in saying that in this country absolute disproportion is extremely rare. This indication thus becomes a relative thing and consequently open to wide interpretation. It seems to me that in spite of X-ray pelvimetry and also the most careful clinical examination, the final decision can only be reached after labour has started. The problem of how long to let labour continue then becomes important. Generally speaking, labour should be allowed to continue as long as there is any progress being made. The final test is also not complete without a period of trial with ruptured membranes. Many times one sees a patient making very little progress for many hours and then by rupturing the membranes rapid progress is made in a reasonable length o ftime. Of course one must always remember, especially if labour is prolonged or it is anticipated to be prolonged, to give fluids, sedatives and chemotherapeutic drugs adequately but judiciously, so that if the patient does eventually require a section she will be in the best possible condition.

Since this is the commonest indication for Caesarean Section it is here that one is best able to keep the rate down. It is also here that the greatest skill and the finest judgment in obstetrics is required.

previous section is the next indication in order of frequency. This accounted for 28% in this series which is about average for any large group.

Generally speaking, when a patient has a Caesarean for a delivery, further sections for subsequent deliveries are recommended. However, there are times when vaginal delivery might properly follow a Caesarean. If a patient has had one or more previous normal vaginal

deliveries followed by a Caesarean Section for a temporary condition, she might then be allowed to deliver vaginally. One must be sure the previous postoperative course was uneventful and that a low transverse type of section was performed.

HEMORRHAGIC COMPLICATIONS The two conditions, Placenta Praevia and Accidental Haemorrhage, may be considered together and in this series accounted for 12.5% of the total sections, which again is about average.

We hesitate to do sections on cases of Abruptio Placentae and do so more for foetal than maternal reasons. By far the largest number are treated by other means.

In cases of Placenta Praevia, Caesarean Section is carried out much more frequently. We like to carry these patients close to term if possible and then perform a section, if vaginal examination in the operating room demonstrates the placenta to be partly or completely over the cervical os.

In both these conditions various factors must frequently be considered and sound obstetrical judgment is required. Broadly speaking, in cases of Accidental Haemorrhage when there is doubt as to whether one should do a Caesarean Section or not, don't do it, and in Placenta Praevia when there is some doubt, do it.

TOXEMIA Toxemia accounted for 5.4% of the sections in this 10-year period. This is a category that has given us some concern as it is lower than for many of the figures reported. It may be that we should be doing more for this indication. We limit the use of section in the delivery of toxemic patients really to those that require termination and cannot be induced to begin labour. Many times it would be simpler and easier to perform a section but we think that most of them are better delivered vaginally if possible. It might also be added that to recommend this method of treatment for toxemia of pregnancy in very many instances might soon lead to its too wide application with consequent worsening of results.

There are many more indications for the use of Caesarean Section, none of which taken alone reach a very significant number. However, each of them must be carefully evaluated as they arise and one must be sure that a true indication is present. We must keep in mind when deciding to deliver a primigravida by Caesarean Section, that we are also deciding that each subsequent pregnancy in this patient be terminated the same way.

At the Mount Hamilton Maternity Hospital, although there are no regulations regarding consultations, we rarely make the final decision on a patient to do a Caesarean Section without asking someone else to see that patient. The responsibility is shared, and not infrequently points are brought out by a fresh observer which are overlooked by the person constantly following the case. This is all done on a voluntary basis and we all can enthusiastically recommend it to you.

SUMMARY We believe that 3 or 4 obstetrical patients out of 100 should be delivered by a Low Transverse type of Caesarean Section. The indications are often not clear cut and the decision as to its necessity should be seriously and conscientiously considered and also shared by a colleague.

FIBROMYOMATA UTERI

T. G. RYLEY, M.D.

FIBROMYOMATA are by far the commonest tumours of the uterus. It has been stated that 20% of women over 35 years of age have uteri harbouring this tumour. Many complications are generally believed to result from the presence of these lesions, foremost among these being abnormal uterine bleeding and interference with the process of normal reproduction.

In an attempt to gain some information on this subject, other than by clinical impression, 100 cases of fibromyomata were taken at random from the records of the Toronto General Hospital.

INCIDENCE

AGE		
	Over 70– 3	30 to 40–22
	60 to 70– 7	20 to 30– 2
	50 to 60–18	Under 20– 0
	40 to 50–48	

It is seen that almost one half of the women with fibroids were between 40 and 50 years of age. This is in accordance with the findings of others.

PARITY It is frequently stated that the presence of uterine myomata is accompanied in a high proportion of cases by sterility and complications of pregnancy, especially abortion, premature labour and abnormal presentations. Obstruction to labour may also occur if the tumours are cervical and of a large size. Our findings are tabulated below.

A	Parous	66
	1. Multiparous	42
	2. Para I	24
B	Nulliparous	32
	1. Married	10
	2. Single	22

Of the 76 married women, 66 or 88% bore 191 children. The incidence would conceivably be higher because the nulliparity in the 10 married women was probably voluntary or due to the husband in several cases. However, it is true that 76 of our cases were over 40 years of age and past the childbearing period of life. It must be considered that a certain number of these women bore their children before the onset of the growth of the fibroids or their growth to an appreciable size. Nevertheless, it is established that there is minimal growth of existing fibroids and appearance of new ones after the menopause. Consequently a large number of the above women probably had uteri harbouring these tumours during a certain number of their childbearing years. It is probable that the importance of fibroids complicating pregnancy has been exaggerated.

SYMPTOMS

Our 100 cases represent, in the large part, women with various pelvic and abdominal signs and symptoms upon which it was deemed necessary to operate. In this sense our series of 100 cases is a selected group. It is undoubtedly true that the large majority of women with myomata never experience any symptoms. A considerable number of these in whom fibroids are discovered on routine examination are never informed of the presence of the tumours. The percentage of women who come to operation is small. In our series the presenting symptoms were:

	Percent
Abnormal bleeding	64
Menorrhagia	43

	Percent (cont.)
Metrorrhagia	13
Postmenopausal	17
No symptoms	20
Awareness of an abdominal mass	11
Pelvic pain or discomfort	8
Difficulty in urination	2

As can be seen there are no specific symptoms of myomata. Most of the symptoms are only associated with the presence of the tumours and could be caused by many other lesions.

Uterine bleeding

Abnormal bleeding occurred in 64 of the women in this series. However, merely because fibroids are associated with bleeding, it does not necessarily follow that the fibroids are the direct cause of the bleeding. Of the 64 women with this symptom, in only 34 or approximately one half could the bleeding be ascribed directly to the presence of fibroids. In 30, the tumours coexisted with endometrial hyperplasia, carcinoma, endometriosis, cervical polyps, etc., all frequent causes of haemorrhage.

It is generally stated that abnormal bleeding associated with the presence of fibroids is most common with the submucous variety. We found that in our group of 64 women with bleeding, that 34 (53%) had submucous myomas, while in the non-bleeders only 7 (20%) had submucous myomas.

The above impression is probably correct but uteri with submucous myomata are usually larger and more involved generally with the disease, and hence more apt to produce abnormal bleeding.

Position of myomata

Subserous	30%
Submucous	28%
Intramural	55%

Little attempt has been made in the past to determine the factors affecting the position in the uterus of fibroids. All fibroids are intramural at their birth and either remain intramural or become submucous or subserous. Which they become depends a great deal on whether they were formed near the serosa, near the centre of the myometrium, or near the mucosa. However, other factors probably play a part in determining the position of the tumours. Among these are age, race, parity, genital displacements, and concomitant gynaecological disease.

The relation between parity and position was investigated:

	Subserous	Submucous	Intramural
Parous	29%	27%	70%
Nulliparous	50%	46%	46%

It is seen that there is approximately an equal incidence of subserous and submucous fibroids in each of the nulliparous and parous groups. There is a considerably lower percentage of subserous and submucous fibroids in the parous groups. This is accompanied by a much higher incidence of intramural fibroids. The cause of this is open to speculation. One possible explanation is that in pregnancy, the thickening and stretching of the uterus tends to incorporate any subserous or submucous fibroids in the myometrium.

Endometrium

The following statistics are from 81 pathology reports:

	Cases	*Percent*
Proliferative	29	36
Secretory	26	33
Endometrial hyperplasia	14	18
Atrophic	12	15
Total	81	100

This is a high incidence of endometrial hyperplasia and is in accordance with the findings of others. It is probably an expression of some endocrine disturb-

ance, as are the fibroids themselves. Of the 14 cases of endometrial hyperplasia, 11 had abnormal bleeding. Of interest were two pathological reports of endometrial hyperplasia in postmenopausal women.

Endometriosis

Observed in 4 cases.

Associated malignancy

Cancer was discovered in five instances; two of these were carcinoma of the corpus uteri. There was only one case of sarcomatous degeneration in a fibroid. Novak reports 0.45% malignant degeneration of fibroids. The other two were primary carcinoma of the fallopian tube. This is an unusual occurrence, considering the extreme rarity of this malignancy. However, in a series of this size, it is unlikely to have any statistical significance.

Treatment

Of our 100 cases of fibroids, 77 underwent a major operation. This is further evidence of the selected nature of our series.

The type of operation is listed below:

	Cases	*Percent*
Total hysterectomy	64	83
Subtotal hysterectomy ..	9	11
Myomectomy	4	6
Total	77	100

The high incidence (83%) of total hysterectomy is in keeping with the modern trend. This is similar to Novak's centre (Johns Hopkins), where 85% totals are done.

Bilateral oophorectomy was performed in 42 cases or 55% of those operated upon. Seventy-six women in our series were 40 years of age or over and therefore past the usual childbearing period. Oophorectomy also removes forever the danger of ovarian carcinoma with its almost hopeless prognosis. However, it must be considered that the procedure in the younger women will be responsible for a premature, unphysiological and often more distressing menopause.

Summary

1. One hundred cases of fibromyomata were taken at random from the records of the Toronto General Hospital.

2. eventy-six were over the age of 40, one half were between the ages of 40 and 50.

3. Sixty-six of the 76 married women had borne 191 children.

4. The commonest symptom was abnormal vaginal bleeding occurring in 64. In only 34 (53%) of these could the bleeding be ascribed directly to the presence of the tumours.

5. In 81 pathological reports there were 14 cases of endometrial hyperplasia (17%).

6. Cancer was encountered in 5 instances.

7. Eighty-three per cent of the 73 hysterectomies performed were total.

Acknowledgment

I would like to express my appreciation to Dr. M. C. Watson for initiating and assisting in the writing of this article and to Professor D. E. Cannell for his helpful comments.

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CASE REPORT*

ILLUSTRATING THE MANAGEMENT OF A PREGNANCY COMPLICATED BY POLIOMYELITIS AND ECLAMPSIA

AS a combination of disease entities, the following case is a definite rarity, but the management of the various aspects of such a difficult problem certainly warrants discussion. It is doubly interesting because the methods employed resulted in the survival of mother *and* child. In the history which follows, discussion of management will be kept to a minimum and covered more completely by the other participants.

HISTORY (Dr. Smith):

The patient is an 18 year old French Canadian girl who was transferred to the Toronto Western Hospital from the Riverdale Isolation Hospital on Sept. 16th, 1954, with an established diagnosis of:

1. Pregnancy 36-38 weeks (?).
2. Pre-eclampsia.
3. Acute anterior poliomyelitis (paralytic).

Briefly, her history prior to admission was as follows:

From scanty information, (the patient had received no prenatal care) the date of confinement was estimated to be October 22nd. Apparently, the only abnormal symptom prior to the present illness was a two day period of bleeding in April.

On Sept. 8th, the patient developed malaise, feverishness, generalized aches and pains, then backache, headache, abdominal cramps, nausea and vomiting, occasional blurring of vision and mild swelling of the ankles.

On Sept. 10th, she noticed increasing weakness of her extremities and slight difficulty in breathing.

ADMISSION: The following day at St. Joseph's Hospital (Toronto) the above noted diagnosis was made. She was transferred at once to Riverdale Isolation Hospital. During the following five days, the poliomyelitis remained unchanged but her toxaemic symptoms became worse.

Accordingly, on Sept. 16th, she was again transferred, this time to the Western Hospital. Here PHYSICAL EXAMINATION revealed the following:

General: An acutely ill, irritable, obese young woman—mildly dyspnoeic (but not cyanosed) and apparently pregnant. There was generalized oedema.

Head & Neck: Neck rigidity with pain on forced flexion.

Respiratory: Breathing was mainly diaphragmatic. Respiratory rate was 30/minute and regular.

Cardiovascular: B.P. 160/90 and pulse 90.

Abdomen: Obese and flaccid. Liver edge was tender, and two fingers' breadth below the costal margin. A 36 week pregnancy was palpated in the left occiput anterior position; head unengaged and foetal heart heard in the left lower quadrant at 160/minute.

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*Presented at the weekly rounds of the obstetrical service at the Toronto Western Hospital on Sept. 23rd, 1954. Members of staff partieipating:

D. R. F. Smith, M.D., Junior Interne, Obstetrical Service.

J. W. Millson, M.D., Senior Interne, Obstetrieal Serviee.

J. S. Crawford, M.D., F.R.C.P.(C.), Direetor of Physieal Medicine.

T. C. Jewell, M.D., F.R.C.S.(C.), Attending Staff Obstetrieian.

L. T. Armstrong, M.B.(Tor.), Obstetrieian-in-Chief.

Genitourinary: No significant abnormality.
Extremities: Oedema mentioned. See also neurological.
Neurological: Examination revealed a generalized paresis below C.5 and paralysis of both legs.
Laboratory: Urine (catheter) 2+ albumin; bile and urobilin negative. Haemoglobin 55%.

COURSE FOLLOWING ADMISSION: On Sept. 17th, membranes ruptured spontaneously at 12:30 a.m., and the patient started into labour at 2 a.m. Blood pressure at that time was 170/110 and albumin was 2+. By 6 p.m. the cervix was fully dilated but the head was still 2 cm. above the ischial spines. At this time and without warning, the patient had a generalized eclamptic seizure, which was promptly controlled by appropriate sedation (q.v.).

In the tonic stage of this seizure, the patient had pushed the head well down below the ischial spines, thus enabling forcepts delivery of a normal female child weighing 7 lbs. 2 ozs. and in no respiratory distress.

The patient was at once taken to a quiet single room and put on our eclamptic routine. Within minutes of her return from the case room, she experienced the first of three generalized convulsions that night. eclamptic sedation was continued and a 10% glucose solution in distilled water was administered intravenously.

During the following day (18th), the patient's condition was static. Doctors Crawford and Park paid her their first visit that afternoon (q.v.). At 9 p.m. the patient suddenly developed a typical picture of acute pulmonary oedema. Pulse was 140; respirations 28; B.P. 140/90. Then at 12 midnight she experienced another similar attack. Following immediate treatment in both cases, these signs and symptoms slowly subsided and although her preexisting condition remained unchanged, the patient showed no further evidence of pulmonary oedema well into the next day (19th).

At the end of this time, Dr. Crawford re-examined her and it was decided to place the patient in the Drinker respirator. This treatment proved a failure in several respects, acute pulmonary oedema recurred, and she was promptly removed from the respirator. Emergency treatment of the pulmonary oedema was followed by bronchoscopy and tracheotomy. The patient showed marked improvement on return to the ward, where she subsequently received 500 cc of whole blood to correct anaemia. Further supportive treatment included physiotherapy and leg-braces. At present she has full use of her upper extremities and is recovering the use of her lower extremities. Post partum course has been otherwise uneventful.

OBSTETRICAL DISCUSSION (Dr. Millson):

There is no point in estimating the incidence of such a rare combination. Eclampsia ocurs once in every 400-500 pregnancies. Roughly 10-15 per cent of eclamptic mothers die and up to 45 per cent of the infants.

It is estimated that in given year, 7-11 per cent of women in the reproductive age group will become pregnant. In a series of 1148 cases of poliomyelitis(1), 190 patients were women in the reproductive age group. Of these, 49 or 26 per cent were pregnant, thus suggesting an increased susceptibility of the pregnant patient to poliomyelitis. Maternal mortality in these cases is quoted in the same series as 6 per cent and the fetal loss reported as 32 per cent.

This girl was admitted from the Isolation Hospital after the minimum in-

cubation period of seven days as her toxaemia was progressing unfavourably. Because of the respiratory distress, routine pre-eclamptic sedation with phenobarbital was reduced. Probably as a result of this, and perhaps to the anoxaemia caused by her breathing difficulty, she experienced an antepartum convulsion. The eclamptic routine adopted at this hospital is to place the patient in a quiet room under the constant observation of an experienced attendant. A tray by the bedside contains I.V. sodium amytal, syringes, tourniquet, alcohol, and chloroform with an ether mask (the latter so that if necessary, a nurse could anaesthetize the patient in the event of a convulsion). The emergency treatment is, of course, to administer sodium amytal intravenously in doses of gr. 7½ after each convulsion. Continuous sedation is sodium luminal, gr. ii q. 4h. and this is supplemented after each seizure with pantopon, gr. ⅓ (H) up to a maximum of gr. ii daily. In this girl's case, the amytal had to be reduced to a dose of gr. 3¾ and the continuous sedation cut down similarly because of the state of her respiratory function. All four convulsions were well controlled by this regime.

During the whole antepartum period in hospital, the poliomyelitis was fortunately static. Certainly, we had not anticipated that a convulsion would push the head down as it did. Generally speaking, gravidae stricken with paralytic poliomyelitis can almost complete labour themselves, provided their respirations are reasonably adequate. As it can function independently of the spinal cord, the uterine musculature should be expected to advance the head to the pelvic floor. The paralysed muscles of the floor are relaxed and thus the applications of low forceps causes these patients considerably less discomfort and trauma than healthy women.

If her respiratory excursion continued to be maintained, one might have awaited the advance of the head for several hours after the time of delivery in this case. Three or four hours added to the actual duration of labour here (16 hours) would still not be extraordinary for a young primipara.

The other problem with which we were faced was that of the possible decrease of her respiratory excursion to an anoxic state before completion of the second stage. This would have necessitated delivery in a respirator or as a last resort, carrying out caesarian section under local anaesthetic. Carpenter *et al.* ([2]) recently reported the use of the former method for a fulminating pre-eclamptic with paralytic poliomyelitis.

The anaesthetic of choice in these cases is a pudendal block. We used it here in conjunction with oxygen via the anaesthetic machine, which was also present so that we could bag her if necessary. No problems were encountered with the baby.

The hypertonic glucose administered after the first post-partum seizure was given for its diuretic effect as well as for nourishment.

It is well known that a certain percentage of eclamptics develop residual hypertension. Here, however, we felt that the persistence of elevation of the blood pressure was due to increasing anoxia. On the first postpartum day, her pulse had risen to 140/minute and her breathing became much more distressed. The two attacks of pulmonary oedema that night were probably due to the eclamptic effect on the heart. It is difficult to estimate the extent to which this effect was augmented by the anoxia. The attacks were well controlled with I.V. aminophylline gr. 7½, morphine gr. ⅙ s.c., I.V. digoxin 0.5 mg. and oxygen by nasal catheter. It was at this point that the medical staff decided to put her in the respirator.

NEUROLOGICAL DISCUSSION
(Dr. Crawford):

This is a very interesting case and it combines the treatment of acute poliomyelitis and the treatment of eclampsia, during which a delivery occurred.

With the onset of polio season not far away we in the Toronto Western Hospital felt that it would be our duty to set ourselves up as a designated hospital for the treatment of acute poliomyelitis if the need arose. As a result a poliomyelitis committee was set up, having in mind the results of the experience of the men who handled the Winnipeg and Edmonton epidemic last year. They concluded from their experience that one man cannot treat a case of acute poliomyelitis, especially the bulbar type, by himself. It is wise to have a team available on 24 hour call and the professional services of this team must be on a voluntary basis, as far as the financial aspect is concerned.

In June we set up our poliomyelitis team which consisted of:

(a) an internist
(b) a neurologist
(c) a consultant in Ear, Nose, and Throat
(d) an anaesthetist
(e) an orthopedic surgeon

This team would be on 24 hour call and we felt that in this hospital its main duty would be to assist in the diagnosis of cases and decide on their disposal. We adopted as our policy not to admit cases to the Western Hospital until the Isolation Hospital or the Sick Children's Hospital could take no more, that is, if an epidemic developed. The only other condition on which we would take patients was that if they presented themselves at our Emergency Department and were too seriously ill to be transported to the Isolation Hospital.

Part of the reason we felt that a team was needed for the handling of bulbar poliomyelitis was from the experience in Edmonton, that about 30% of the deaths that occurred were due to complications from respiratory disturbances. These are respiratory acidosis; sudden death from a compensatory alkalosis, if the cause of the retention of CO_2 was suddenly relieved; asphyxia from acute obstruction, either in the posterior pharynx, the trachea, the bronchi, or lung.

These complications can arise in a number of seconds and must be treated promptly. Therefore the patient's ability to exchange gases must be known at all times and individual 24 hour nursing attention must be given.

Dr. Park and I first saw this patient on the afternoon of September 18th. At that time her respiratory excursion was decreased and probably a marked decrease in her tidal air existed (we were unable to measure this at the time). The question arose—would she have a better aerating surface if placed in a respirator? Although she was a bulbar case her respirations were regular. Since her chest was clear and she was resting comfortably we decided to put her in a respirator only if a decrease in the respiratory aerating surface occurred.

I examined this patient again on September 20th and detected dullness in the right base, shift of the trachea to the right, and decreased movement with a decrease of respiratory excursion on the right side. Her temperature was elevated and her blood pressure rising. This rise in blood pressure at a time when her eclampsia seemed improved suggested an early acidosis, the result of a decreased aerating surface. We felt that a respirator might increase the respiratory excursion and open up the lower bronchioles and alveoli. Unfortunately we did not reckon with the patient's nervous state. From the outset she fought the respirator and within a very short time was in acute pulmonary oedema. She was therefore taken from the respirator and an endotracheal tube was inserted by the anaesthetist. She was given Atropine by hypodermic and pure oxygen under positive pressure from the anaesthetic machine. Her pulmonary oedema and cyanosis began to clear rapidly. The question of bronchoscopy then arose, with the distinct possibility of finding a mucus plug in the right main bronchus. Before her pulmonary oedema cleared, bronchoscopic examination might further aggravate the pulmonary congestion. The problem resolved itself within

half an hour by a clinical improvement however, and we felt now that a bronchoscopy might be carried out. During the bronchoscopy a considerable amount of mucus was removed from the right main bronchus but no actual plug was seen. It was felt that suction of the mucus from the lower respiratory tract would be better handled by a tracheotomy and this was carried out at the same time, resulting in further improvement.

We felt that although further obstruction might result in severe catastrophic episode, she should not be put back in the respirator because of her previous experience.

Since then she has improved steadily and tidal air and respiratory excursions have increased. I feel that continuation of present treatment is the best policy.

DR. JEWELL: Little can be added to the foregoing discussion other than a few statistics compiled by Dr. Jacques of the Riverdale Isolation Hospital. During the period August/53–April/54, 75 young women were treated there for poliomyelitis. 23 per cent of these (17 cases) were pregnant, a finding which corresponds to the figure quoted by Dr. Millson.

DR. ARMSTRONG: The greatest lesson derived from this case report is the extreme value of "team work" when one is confronted with complications of pregnancy or labour. When a patient gets into trouble like this, never consider expense but promptly enlist the services of everyone who can possibly contribute to the problem at hand.

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2. Carpenter, F. *et al.*: Am. J. Obst. & Gynec., 68, 663, 1954.

ABSTRACTS AND REVIEWS

Radioresistant Cervical Cancer: Edmund R. Novak, Obstetrics and Gynecology, 251, 1954 (Sept.).

Radiation is generally recognized as the standard treatment for cervival cancer, but surgery represents the only hope for salvage of radiation failures.

Prompt biopsy confirmation of radioresistance is of paramount importance. A summary of criteria for determining radiation effect is as follows: (1) The direct lethal effect on the tumour as demonstrated by necrosis, oedema, nuclear degeneration and progressive disappearance of tumour cells, (2) The fibrotic reaction which tends to wall off nests of tumour cells, (3) The "differentiation effect" as seen by increased keratinization, which decreases further cell division, (4) Activity of individual cells either degeneration or mitosis. A combination of the above variables and technical difficulties makes the correlation of radiation histology and prognosis impossible.

The study of twelve radiation failures subjected to radical surgery suggests that the spinal type of tumour is relatively resistant, that pure tumour strains are rare and that the degree of differentiation does not parallel neoplastic tendencies. Broder's classification of malignancy of tumours on the basis of cellular activity is a more reliable guide than one based solely on the degree of differentiation.

Random biopsy alone can never be the sole criterion of tumour behaviour

following treatment, because there invariably is patchy localized response to radiation, manifested by the presence of normal cells in post radiation smears. Although experience is still limited in this technique, it has been useful in prognosis and successful in detecting early recurrences.

I. G. L. Van Praagh

Management of Diabetes in Pregnancy: R. J. Paalman, Obstetrics and Gynaecology, **4**, 302, 1954.

The author reports on 12 pregnancies in 8 diabetic patients and suggests the following management in such cases:

1. X-ray of the pelvis to reveal calcification in the walls of major blood vessels.
2. Careful estimation of fetal maturity with delivery between 34th and 37th week of gestation.
3. Dietary protein raised to 115 Gm. daily.
4. Hospitalization for regulation of diabetes in 7 of 12 cases.
5. Closely supervised low sodium diet.
6. Caesarian section was performed in 8 of 12 pregnancies. Immediate suction of the infant's stomach in order to prevent regurgitation and aspiration of the large amounts of amniotic fluid seen in diabetic pregnancies.
7. All infants placed in incubators and given no nourishment for the first 36–72 hours postpartum to reduce the oedema characteristically seen in these babies.

The results of this method:

1. 11 of 12 infants survived; one was stillborn.
2. Oedema in 7 of 12 but these responded well to dehydration as above.
3. No maternal mortality.

A. Goldberg

Internal Podalic Version at the New York Lying-In Hospital (1932–1950): Meyer Rosensohn, American Journal of Obstetrics and Gynaecology, **69**, 916, 1954 (Sept.).

In this paper the author tabulates the incidence, indications, contra-indications and results of internal podalic versions done over a period of eighteen years at New York Lying-In Hospital:

1. The overall incidence was 1:309 or about 10 cases per year, in all of which definite indications existed.
2. Uncorrected infant mortality 24.7%. Uncorrected maternal mortality 1.6%.
3. By comparing results with indications, he came to the following conclusions:

   A. It is a serious operation with grave potential dangers to both mother and child.

   B. Its employment in certain conditions in pregnancy and labour was:
   Not warranted in placenta praevia, premature separation, and nulliparae.
   Questionably warranted in malpresentation of labour in a multipara with adequate pelvis, intact membranes, cervix fully dilated, uterus relaxed; and in sudden prolapse of cord with living or dead infant in transverse presentation.
   Warranted for the second of twins.

   C. Morbidity following version decreased by prophylactic use of antibiotic therapy.

D. W. Wilson

Pre-invasive Carcinoma of the Cervix: T. W. Huey, Jr., H. L. Large and P. Kimmelstiel, American Journal of Obstetrics and Gynecology, 68, 3, 1954.

Pre-invasive carcinoma of the cervix (carcinoma-in-situ) is usually treated by total hysterectomy. However, because the lesion so often involves only small areas at the muco-cutaneous junction, some authorities advocate local excision with follow-up vaginal smears. To investigate these methods, the authors correlated biopsy findings with hysterectomy specimens from 71 such cases.

Of 38 patients in which small or superficial biopsy methods were used, 42% of surgical specimens showed residual tumour. Thick-cone biopsies used in 33 of the cases were followed by residual tumour in only 27%. The authors concluded that:

1. Thick-cone biopsy has a better chance of reaching the complete lesion.
2. This type of biopsy gives a better indication of the treatment required.
3. Thick-cone biopsy is not a treatment in itself.

Follow-up vaginal smears are a necessity.

A. Goldberg

A Guide to Hospital Building in Ontario

Prepared by the committee on designing, constructing and equipping of public hospitals in Ontario; printed by authority of the Hon. Mackinnon Philips, M.D.C.M., Minister of Health for Ontario. (307 pages, $10.00). University of Toronto Press, 1954.

The Guide is the above committee's answer to a request made by the Provincial government for a detailed study of all phases of hospital construction. Every problem which faces a hospital planning board is discussed in logical order as follows:

1. Preliminary organization and planning and the appointment of subcommittees.
2. Selection of a site and the formulation of a master plan.
3. Allocation of space for medical and maintenance departments.
4. Accommodation for hospital staff.
5. Construction and finishing.
6. Traffic problems in corridors, stairways and elevators.
7. Power plant and mechanical services.
8. Various specialized services such as radiological facilities, the pathology service and the dietetic department.

The Guide includes well detailed blueprints of model hospital departments together with suggested dimensions of rooms, amount and type of equipment, etc. in table form) for hospitals ranging in size from 50-1200 beds.

The writers point out that until the present time, only fragmentary information on hospital building has been available in Government pamphlets and professional literature. Therefore, this Guide should prove invaluable to architects and hospital boards alike when planning similar facilities in the Province.

A. Goldberg

OF CURRENT INTEREST

Medical Society

The annual Faculty show, Daffydil, is to be held in the Hart House Theatre from December 13th to 17th. Chairman of the show is Murray Herst. The Directors are Dave Sackin and Dick Railton. Paul Steinhauer is again Music Director. Graduates may purchase tickets at the hospitals or by writing Ernie Brown, Daffydil Business Manager, Medical Society Office.

The third meeting of the Music Club will be held in the last week of November. The exact date will be posted. The Club presents a varied program and all interested students are encouraged to attend. This year's annual week-end at Caledon Hills Farm will be from Jan. 28th to Jan. 30th.

The annual Medical-at-Home, the dance of the season, will be held at the Royal York Hotel on Thursday, February 17th, at nine o'clock. The theme of the dance is "Medical Research" and Toronto's contributions to it. All alumni and undergraduates are warmly invited to attend and to bring their interested friends. The dress is optional and tickets are three dollars.

During the past summer, the long awaited common room for medical students has been built. Its location is the site of the old physiology labs on the first floor of the Medical Building. This much needed improvement was made possible by a gift from Dr. Wallace Duncan, a graduate of 2T1 as a memorial to his father, the Rev. George P. Duncan, D.D. At present the room is being furnished and will be available for use in the near future.

The Medical Women's Undergraduate Association opened the school year with a party for the girls of the first Premedical year, given at the home of the president, Marjorie Swanson, by the executive and the girls of the fourth Medical year.

The undergraduate women were entertained at a supper party on Oct. 5th by the Ontario Division of the Canadian Federation of Medical Women at the home of Drs. Marjorie Davis and Geraldine Maloney. Approximately 140 graduates and undergraduates were present.

The M.W.U.A. initiation banquet was held at Casa Loma on Oct. 26th when fourteen new members were welcomed into the faculty. The honorary president, Dr. Marjorie Davis, spoke briefly, welcoming the initiates, and Dr. Marion Hilliard showed slides of her recent trip to Europe.

Faculty

Dean J. A. MacFarlane, Professors R. F. Farquharson, R. M. Janes and D. E. Cannell attended the meeting of the Royal College of Physicians and Surgeons, held recently in Winnipeg.

Dean J. A. MacFarlane and Professor J. K. W. Ferguson attended the Annual Meeting of the Association of Canadian Medical Colleges held recently.

Recent visitors to the Faculty have been:

Professor R. Heim Balsac, Cardiologist from the Faculty of Medicine, University of Paris, France.

Dr. Donald Hunter, from the staff of the London Hospital Medical School, is the Sims Commonwealth Lecturer. He visited Toronto from October 25th to November 3rd, and during this time he was present at the final year theatre clinic and pathological conference. He also addressed the Medical Staff Meeting. His chief interest is industrial Medicine.

The Donald C. Balfour Lecture in Surgery was delivered by Robert Milnes Walker, M.S., F.R.C.S., Professor of Surgery, University of Bristol, on October 7th, 1954, in the Best Institute. The subject of the lecture was: "Portal Venous Obstruction".

Dean J. A. MacFarlane represented the University of Toronto at the Centenary celebration of the Faculty of Medicine at Queen's University.

The following awards have been made:

The Harvey Harnick Scholarship
R. G. Lee (1st Premed. Yr.)

The Samuel Godfrey Scholarship
R. E. Mathews (1st Premed. Yr.)

A Medical Alumni Association Scholarship.....R. L. Joynt (1st Premed. Yr.)

C.I.P.S. Report

The annual report of the Canadian Interne Placement Service presented at the C.A.M.S.I. conference in Winnipeg will appear in the C.A.M.S.I. Journal, but some facts may be of interest to Toronto students.

Originally conceived in Toronto as an orderly and systematic scheme, C.I.P.S. influences neither students nor hospitals due to its impersonal and mechanical dovetailing of choices.

It must be remembered that the number of applicants receiving their first choice varies with the number of applicants to any one hospital. For example, in 1953, with many internes showing preference for smaller centres, 93% of Toronto students received their first choice; in 1954, however, there was a greater interest in Toronto hospitals, and subsequently only 73% got their first choice.

Further information regarding interne placement can be obtained from Ted Graham, III Meds.

The following are the results of last year's interne selections:

University	*Total*	*First*	*Second*	*Third*	*Fourth*	*Fifth*	*Unplaced*
U.B.C.	49	48	1	0	0	0	0
Alberta	62	56	5	0	1	0	0
Western	46	35	4	2	0	0	5
Toronto	138	99	22	9	5	1	2
Queen's	44	34	8	2	0	0	0
McGill	44	43	1	0	0	0	0

R. H. RAILTON.

ADDRESSES OF GRADUATING CLASS OF 1954

Abramson, H.	Mount Sinai Hospital, Cleveland, Ohio.
Ainslie, R. D.	St. Michael's Hospital, Toronto.
Ainslie, W. H.	St. Michael's Hospital, Toronto.
Arscott, A. G.	St. Joseph's Hospital, Toronto.
Awerbuck, B. G.	King's County Hospital, Brooklyn, N.Y.
Baird, R. J.	Toronto General Hospital, Toronto.
Bak, Z.	St. Michael's Hospital, Toronto.
Balinson, N. V.	Hamilton General Hospital, Hamilton, Ont.
Basian, H.	Buffalo General Hospital, Buffalo, N.Y.
Berner, Miss M. B.	Toronto East General Hospital, Toronto.
Berry, H.	Toronto General Hospital, Toronto.
Billings, R. F.	Toronto East General Hospital, Toronto.
Blevis, L. S.	New Mount Sinai Hospital, Toronto.
Blundell, P. E.	Toronto General Hospital, Toronto.
Bocknek, M. M.	Central Emergency Hospital, Washington, D.C.
Bodrug, A.	Toronto East General Hospital, Toronto.
Boeschenstein, F. C.	Toronto General Hospital, Toronto.

Boyer, D. E.	Toronto General Hospital, Toronto.
Brent, H. P.	Toronto East General Hospital, Toronto.
Brett, F.	St. John's General Hospital, St. John's, Nfld.
Brodie, D. W.	Toronto Western Hospital, Toronto.
Burrell, A. P.	St. Michael's Hospital, Toronto.
Burrows, G. M.	Toronto General Hospital, Toronto.
Ceresney, F. P.	St. Joseph's Hospital, Toronto.
Chapel, J. L.	Hamilton General Hospital, Hamilton, Ont.
Chaplan, A. A.	Wayne County General Hospital, Eloise, Mich.
Charters, J. E.	Victoria Hospital, London, Ont.
Chase, N. D.	Toronto East General Hospital, Toronto.
Clark, Miss B. A.	Toronto General Hospital, Toronto.
Coates, D. B.	St. Michael's Hospital, Toronto.
Coates, W. R.	Vancouver General Hospital, Vancouver, B.C.
Colwill, J. C.	King's County Hospital, Brooklyn, N.Y.
Cormack, G. D.	Toronto East General Hospital, Toronto.
Coulter, J. G.	Calgary General Hospital, Calgary, Alta.
Cridland, Miss J. E. L.	Toronto East General Hospital, Toronto.
Cruickshank, Miss J. E.	Toronto Western Hospital, Toronto.
Culp, E. M.	Hamilton General Hospital, Hamilton, Ont.
Dale, G. G.	Toronto Western Hospital, Toronto.
Davies, Miss H. I.	Toronto East General Hospital, Toronto.
Deller, J. C.	Hamilton General Hospital, Hamilton, Ont.
Deyo, G. M.	Toronto East General Hospital, Toronto.
Digby, J. W.	Toronto Western Hospital, Toronto.
Dobbs, K.	St. Michael's Hospital, Toronto.
Dunham, Miss M. C.	St. John's General Hospital, St. John, N.B.
Edmonds, E. P.	St. Michael's Hospital, Toronto.
Elder, A. M.	Hamilton General Hospital, Hamilton, Ont.
Francis, W. G.	Toronto Western Hospital, Toronto.
Fraser, V. M.	Toronto General Hospital, Toronto.
Freedman, H. B.	King's County Hospital, Brooklyn, N.Y.
Gaviller, E. A.	Hamilton General Hospital, Hamilton, Ont.
Gear, J. R.	Toronto East General Hospital, Toronto.
Gerow, F. J.	St. Michael's Hospital, Toronto.
Gibson, E. S.	Toronto General Hospital, Toronto.
Gibson, J. D.	St. Michael's Hospital, Toronto.
Giffen, A. B.	Toronto Western Hospital, Toronto.
Gilmour, J. L.	Vancouver General Hospital, Vancouver, B.C.
Glatt, B. S.	King's County Hospital, Brooklyn, N.Y.
Griffin, Miss J. H.	Toronto East General Hospital, Toronto.
Griffiths, F. E. A.	Toronto General Hospital, Toronto.
Haidinyak, A. L.	Toronto East General Hospital, Toronto.
Haley, J. F.	Toronto East General Hospital, Toronto.
Hall, Miss E. A.	Toronto Western Hospital, Toronto.
Hall, J. S.	Toronto General Hospital, Toronto.
Hallett, W. M.	Toronto Western Hospital, Toronto.
Hanley, W. B.	Toronto Western Hospital, Toronto.
Hardy, L. W.	Toronto General Hospital, Toronto.
Hipwell, W. T.	St. Michael's Hospital, Toronto.
Hirano, G.	St. Michael's Hospital, Toronto.
Horne, G. M.	St. Joseph's Hospital, Toronto.

Hornstein, Miss V. E.	New Mount Sinai Hospital, Toronto.
Humphrey, J. G.	Toronto General Hospital, Toronto.
Hunter, R. D.	Toronto Western Hospital, Toronto.
Kaminker, A. H.	Mount Sinai Hospital, Cleveland, Ohio.
Kazdan, M. S.	New Mount Sinai Hospital, Toronto.
Keenleyside, J. G.	Toronto Western Hospital, Toronto.
Kilty, H. C.	St. Michael's Hospital, Toronto.
King, J. K.	Toronto General Hospital, Toronto.
Klassen, P. W.	Holy Cross Hospital, Calgary, Alta.
Klassen, W.	Regina General Hospital, Regina, Sask.
Knupp, G. C.	Toronto General Hospital, Toronto.
Kreel, I.	Toronto General Hospital, Toronto.
Kyle, Miss S. G.	St. Joseph's Hospital, Toronto.
Laker, H. I.	St. Vincent's Hospital, Toledo, Ohio.
Langley, R. K.	Hamilton General Hospital, Hamilton, Ont.
Lerner, Miss O.	Saskatoon City Hospital, Saskatoon, Sask.
Lewis, H. Y.	St. Michael's Hospital, Toronto.
Lippert, R. G.	Calgary General Hospital, Calgary, Alta.
Little, W. F.	Toronto Western Hospital, Toronto.
Lofchy, A. N.	Toronto General Hospital, Toronto.
McCorvie, D. R.	Edward W. Sparrow Hospital, Lansing, Mich.
McCurdy, Miss M. J.	St. Paul's Hospital, Vancouver, B.C.
McDermot, Mrs. R. S. R.	Ottawa Civic Hospital, Ottawa, Ont.
McFarland, D. W.	St. Joseph's Hospital, Flint, Mich.
McKay, M. H.	Hamilton General Hospital, Hamilton, Ont.
McKee, Miss M. E.	St. Michael's Hospital, Toronto.
McKee, T. D.	Western Pennsylvania Hospital, Pittsburgh, Pa.
McKenzie, D. H. H.	Toronto Western Hospital, Toronto.
MacKenzie, J. R.	Toronto Western Hospital, Toronto.
McMillin, R. S.	Toronto Western Hospital, Toronto.
Martin, J. C.	Toronto Western Hospital, Toronto.
Martyn, J. W.	St. Michael's Hospital, Toronto.
Matvenko, J.	St. Michael's Hospital, Toronto.
Moffat, J. H.	St. Michael's Hospital, Toronto.
Moher, H. J.	St. Joseph's Hospital, Toronto.
Montgomery, D. B.	Toronto General Hospital, Toronto.
Moran, J. H.	St. Michael's Hospital, Toronto.
Mortimer, N. W.	Toronto Western Hospital, Toronto.
Morton, P. L.	New Mount Sinai Hospital, Toronto.
Nedilski, M. M.	St. Michael's Hospital, Toronto.
Neill, R.	Toronto Western Hospital, Toronto.
Nishikawa, R.	St. Michael's Hospital, Toronto.
Noble, A. J.	Toronto East General Hospital, Toronto.
Noguchi, A.	Toronto East General Hospital, Toronto.
Osborn, N. J.	St. Joseph's Hospital, Toronto.
Pelton, D. A.	St. Michael's Hospital, Toronto.
Perkin, R. L.	Toronto General Hospital, Toronto.
Pike, E.	New York Hospital, New York, N.Y.
Raizin, L. H.	Detroit Sinai Hospital, Detroit, Mich.
Reid, L. T.	St. Joseph's Hospital, Toronto.
Renwick, W. A.	Toronto East General Hospital, Toronto.

Riddell, W. A.	Harper Hospital, Detroit, Mich.
Riengwertz, J. W.	New Mount Sinai Hospital, Toronto.
Roberts, A.	Toronto General Hospital, Toronto.
Rosen, I. B.	Toronto General Hospital, Toronto.
Rosen, L. J.	New Mount Sinai Hospital, Toronto.
Rubenzahl, S.	St. Joseph's Hospital, Toronto.
Ruse, J. L.	St. Michael's Hospital, Toronto.
Russell, Miss B. O.	Vancouver General Hospital, Vancouver, B.C.
Sakamoto, K.	Vancouver General Hospital, Vancouver, B.C.
Saks, L.	St. Elizabeth Hospital, Covington, Kentucky.
Sarles, Miss S. A.	Toronto General Hospital, Toronto.
Shostack, B.	King's County Hospital, Brooklyn, N.Y.
Silverstein, E. A.	Toronto General Hospital, Toronto.
Sims, S. D.	St. Michael's Hospital, Toronto.
Singer, E. B.	Toronto General Hospital, Toronto.
Skain, F. J.	St. Michael's Hospital, Toronto.
Sladen, J. G.	St. Michael's Hospital, Toronto.
Smith, D. R. F.	Toronto Western Hospital, Toronto.
Smythe, C. A.	Toronto General Hospital, Toronto.
Stalker, M. J. B.	Toronto General Hospital, Toronto.
Stears, J. C.	Toronto Western Hospital, Toronto.
Sylvester, A. B.	Toronto General Hospital, Toronto.
Symons, F. A.	Toronto East General Hospital, Toronto.
Tari, H.	St. Joseph's Hospital, Toronto.
Thomson, H. G.	Toronto General Hospital, Toronto.
Thow, G. B.	Toronto East General Hospital, Toronto.
Torem, M.	Toronto General Hospital, Toronto.
Trusler, W. C.	Toronto Western Hospital, Toronto.
Van Praagh, D. R. M.	Toronto General Hospital, Toronto.
Vernon, C. P.	Toronto General Hospital, Toronto.
Vince, D. J.	Toronto General Hospital, Toronto.
Wagner, J.	Mount Sinai Hospital, Cleveland, Ohio.
Ward, T. F.	St. Michael's Hospital, Toronto.
Watson, R. J.	Toronto General Hospital, Toronto.
Watt, G. D. L.	Toronto General Hospital, Toronto.
Wilson, R.	Toronto General Hospital, Toronto.
Witterick, G. H.	Toronto East General Hospital, Toronto.
Worling, R. V.	Hamilton General Hospital, Hamilton, Ont.
Yarrow, A. R.	Vancouver General Hospital, Vancouver, B.C.

Announcements for this column should be typed double spaced, kept to a reasonable minimum and submitted on or before the 15th of the month prior to the issue desired. Use address on the masthead page in the front of this journal.

RECENT ACCESSIONS TO THE MEDICAL READING ROOM

Bett, W. R.: **The preparation and writing of medical papers for publication.** 2nd ed. 1953.
Burch, G. E.: **A primer of venous pressure.** 1950.
Finney, D. F.: **Statistical method in biological assay.** 1952.
Fisher, R. B.: **Protein metabolism.** 1954.
Florey, (Sir) H. W.. ed.: **Lectures on general pathology.** 1954.
Fontaine, R.: **Le traitement chirurgical de l'hypertension artérielle.** 1952.
Friedberg, C. K.: **Diseases of the heart.** 1949.
Jones, M. S.: **The therapeutic community.** 1953.
Ingham, H. V.: **The process of psychotherapy.** 1954.
Johns Hopkins University. McCollum-Pratt Institute: **Asymposium on the mechanism of enzyme action.** Ed. by McElroy and Glass. 1954.
Karpovich, P. V.: **Adventures in artificial respiration.** 1953.
Langlois, J. A. M.: **Pediatrie pratique.** 1954.
Mayo Clinic. Committee on dietetics: **Mayo Clinic diet manual.** 2nd ed. 1954.
Oginsky, E. L.: **An introduction to bacterial psychology.** 1954.
Pearse, A. G. E.: **Histochemistry, theoretical and applied.** 1953.
Hopes, M. W.: **Synovial fluid changes in joint disease.** 1953.
Schinz, H. R.: **Roentgen–Diagnostics.** 4 vols. 1954.
Shelley, W. B.: **Classics in cilnical dermatology.** 1954.
Strode, G. K.: **Yellow fever.** 1951.
Wilkins, L.: **The diagnosis and treatment of endocrine disorders in childhood and adolescence.** 1953.
Williamson, B.: **A handbook on diseases of children.** 1953.
World Medical Association: **Seventy-five years of medical progress 1878–1953.** 1954.

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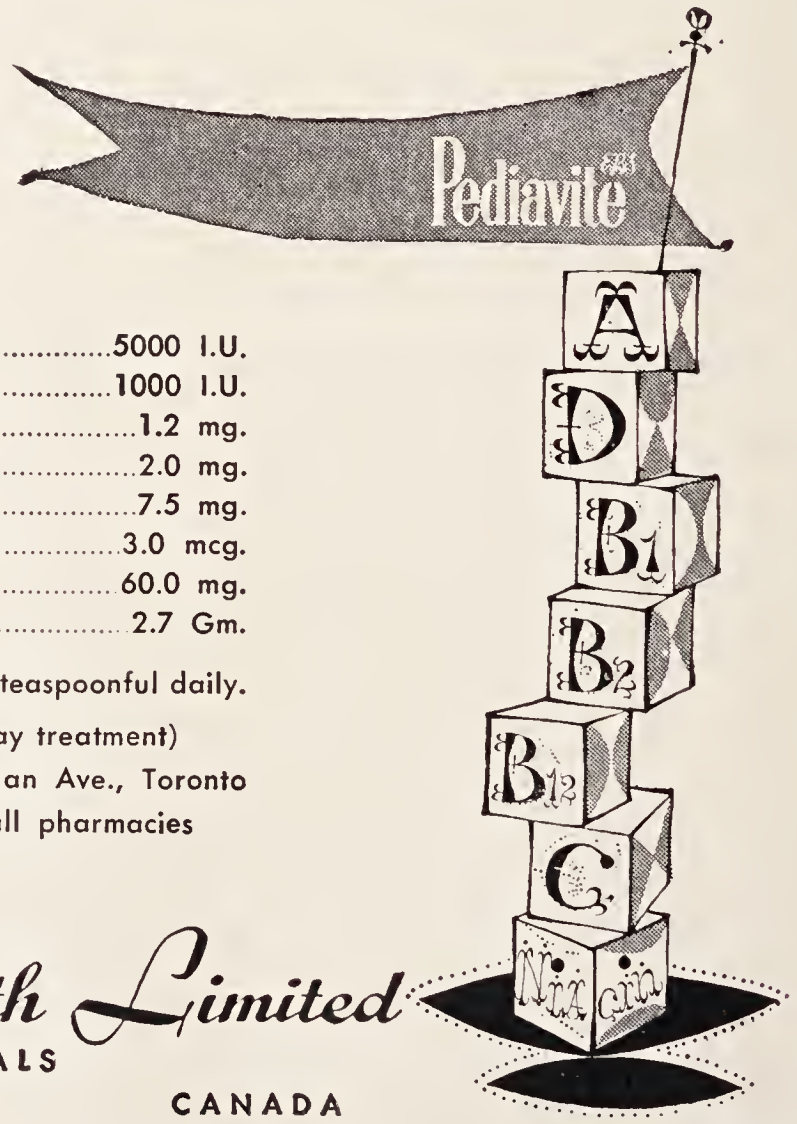

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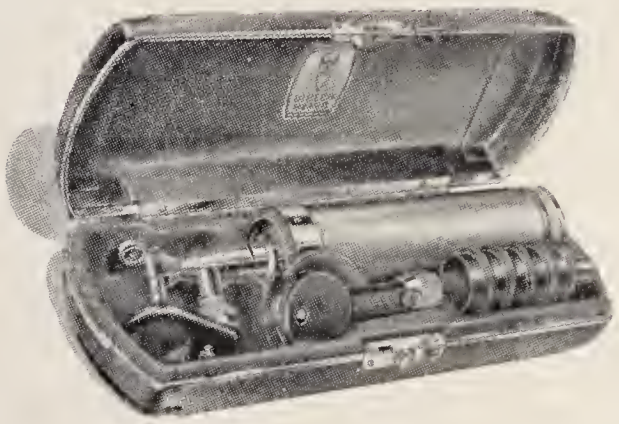

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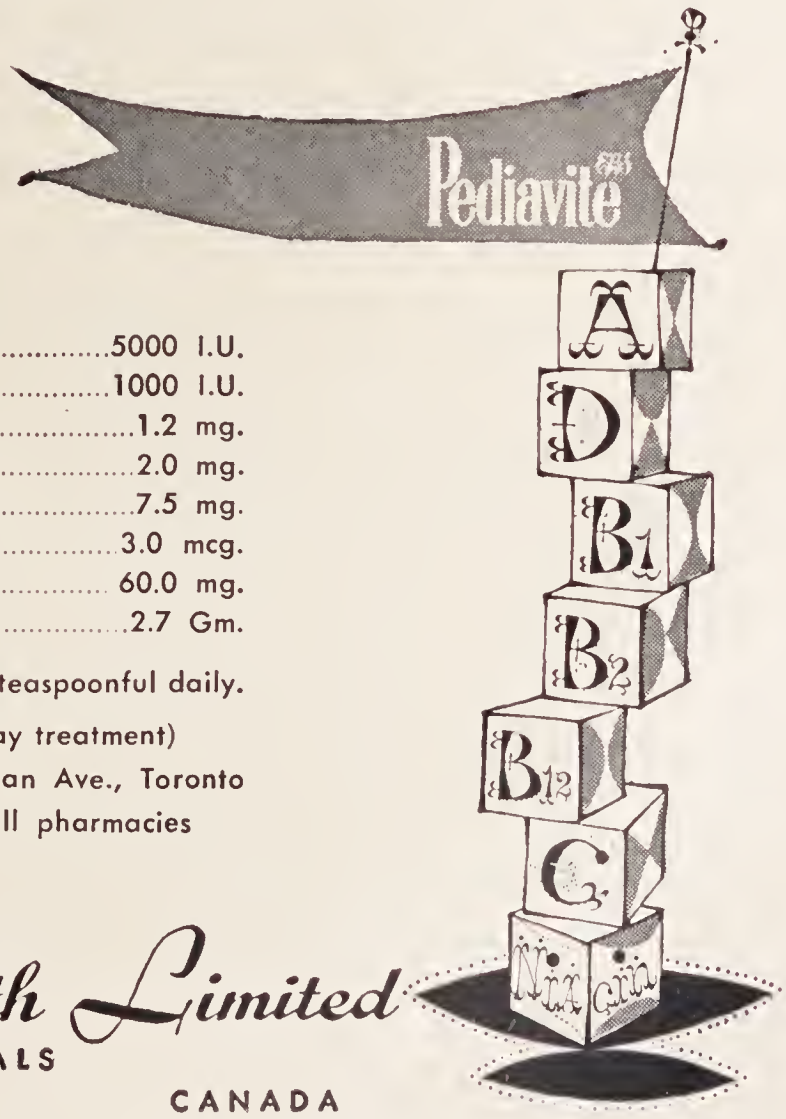

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Riboflavin	2.0 mg.
Niacinamide	7.5 mg.
Vitamin B_{12}	3.0 mcg.
Ascorbic Acid	60.0 mg.
Dextrose	2.7 Gm.

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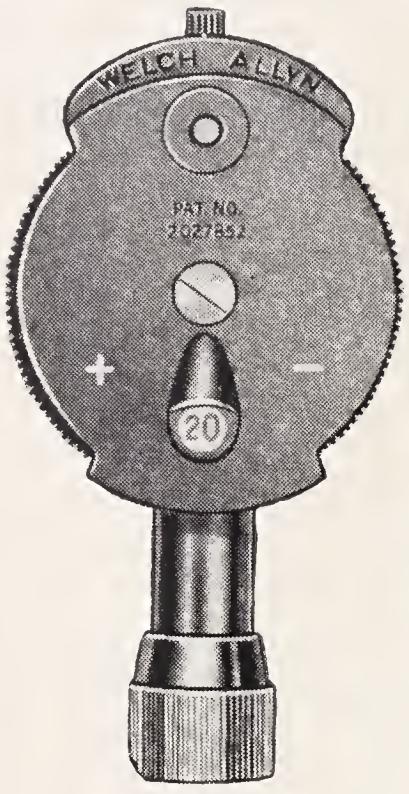

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Farmer's Wife No. 3 Yellow Label

IMPORTANT STEP FORWARD IN PACKAGING OF FORMULA MILKS

All Farmer's Wife Formula Milks are now supplied in new modern tins with smooth, golden-enamel lining, which prevents contact between the tin and raw metal. These new tins are vacuum packed so that all the natural flavour and nourishment are retained in the milk. Tins are now thoroughly cleansed and sterilized before filling—and tin and contents are sterilized after being filled and sealed. These added protections are possible ONLY with this stronger type of tin.

ALMOST DOUBLE VITAMIN D CONTENT IN FARMER'S WIFE FORMULA MILKS

All three types of Farmer's Wife Formula Milks are increased in Vitamin D content from 480 International Units to 800 International Units per concentrated pint with the addition of Vitamin D_3 in crystalline form. Farmer's Wife Formula Milks were the first in the field to introduce this important dietary addition.

MOTHERS WILL LIKE THE BRIGHT NEW LABELS

Farmer's Wife new modern tins now have a bright new label, but are still identified as to type by the same familiar colours.

Professional enquiries invited on milk formulae

COW & GATE (CANADA) LIMITED

Brockville - Ontario

"SPECIALISTS IN THE PROCESSING OF MILK FOODS FOR INFANT FEEDING"

During PREGNANCY and LACTATION

"FERROGEN" COMPOUND

Tablet No. 450 "Frosst"

Each sugar-coated tablet contains:

Ferrous sulphate B.P.	325 mg. (5 gr.)
*Bone flour (edible)	325 mg. (5 gr.)
Vitamin D	500 I.U.
Vitamin A acetate	1500 I.U.
Vitamin B_1	1 mg.
Riboflavin	1 mg.
Niacinamide	5 mg.
Vitamin C	30 mg.
Sodium iodide	0.2 mg. (1/325 gr.)

*Average content: calcium 110 mg., phosphorus 50 mg., fluorine 0.4 mg., and other trace elements.

Packaged in bottles of 100 tablets.

IRON
CALCIUM
IODINE
AND
VITAMIN
TABLET

DOSAGE: In order to establish tolerance to iron, full dosage should be arrived at gradually. One tablet daily after the main meal for several days, increase to two tablets daily, one after breakfast and after lunch for several days and, finally, **one tablet three times daily after meals.**

Frosst

Charles E. Frosst & Co.
MONTREAL CANADA

A GENERAL ANALGESIC

for relief of

PAIN

- Effects are exerted promptly, without untoward reactions, and persist from 3 to 6 hours.
- No adverse effect on the heart, kidney or respiratory system.
- Smooth muscle is affected minimally.

Ⓝ 262 TABLETS
(Coloured Grey)

Acetophen	3½ gr.
Phenacetin	2½ gr.
Caffeine citrate	½ gr.
Codeine phosphate	1/8 gr.

This formula is also available as **"222 TABLETS"**, *white.*

Ⓝ "282 TABLETS"
(Coloured Yellow)

Formula of "262 Tablets" modified to contain Codeine phosphate.. **1/4 gr.**

Ⓝ "292 TABLETS"
(Coloured Pink)

Formula of "262 Tablets" modified to contain Codeine phophate.. **1/2 gr.**

DOSAGE: One tablet with water, three or four times daily.

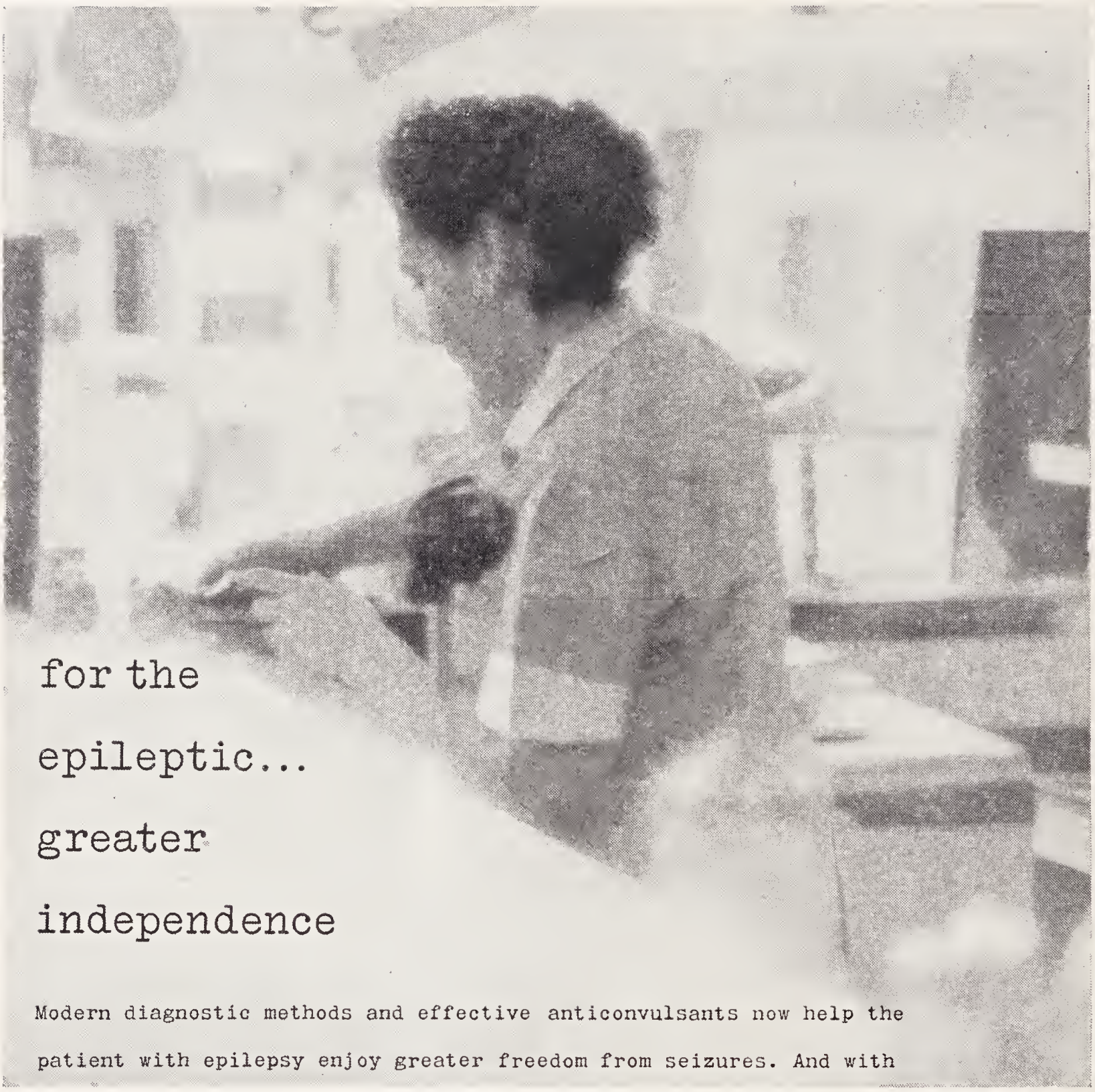
Available according to your prescription.

Ⓝ Narcotic prescription required.

"ACETOPHEN"
Brand of acetylsalicylic acid
COMPOUNDS
WITH CODEINE

Frosst

Charles E. Frosst & Co.
MONTREAL CANADA



for the

epileptic...

greater

independence

Modern diagnostic methods and effective anticonvulsants now help the patient with epilepsy enjoy greater freedom from seizures. And with a more understanding society, greater independence is assured.

DILANTIN® SODIUM (diphenylhydantoin sodium, Parke-Davis)

an established anticonvulsant of choice, alone or in combination, for control of grand mal and psychomotor seizures -- without the handicap of somnolence.

DILANTIN Sodium is supplied in a variety of forms -- including Kapseals® of 0.03 Gm. (½ gr.) and 0.1 Gm. (1½ gr.) in bottles of 100 and 500.

MEDICAMENTA VERA

Parke, Davis & Company, Ltd.

WALKERVILLE, ONTARIO